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RECORD OF DECISION

SYNERTEK BUILDING #1

SUPERFUND SITE

SANTA CLARA, CALIFORNIA

JUNE 28, 1991

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

RECORD OF DECISION

PART I: DECLARATION

PART II: DECISION SUMMARY

PART III: RESPONSIVENESS SUMMARY

SYNERTEK BUILDING #1

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JUNE 28, 1991

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

Concurrences for
SYNERTEK BUILDING #1 SUPERFUND SITE
RECORD OF DECISION

I concur with the remedy selected by the State of California for the Synertek Building #1 Superfund site and recommend that the Deputy Regional Administrator sign the Record of Decision.

Joseph B Healy Jr
Joseph B. Healy, Jr.
Remedial Project Manager
South Bay Section

6/26/91
Date

James C Hanson
Jim Hanson, Chief
South Bay Section

6/26/91
Date

David B. Jones
Dave Jones, Chief
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6/26/91
Date

Jerry Clifford
Jerry Clifford
Deputy Director for Superfund
Hazardous Waste Management Division

6/27/91
Date

Jeff Zelikson
Jeff Zelikson, Director
Hazardous Waste Management Division

7-15-91
Date

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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I concur with the remedy selected by the State of California for the Synertek Building #1 Superfund site and recommend that the Deputy Regional Administrator sign the Record of Decision.

_______________________ 6.26.91
for David Howekamp, Director — Date
Air and Toxics Division

_______________________ 6/20/91
Harry Seraydarian, Director — Date
Water Management Division

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PART I. DECLARATION

1.0 SITE NAME AND LOCATION

Synertek, Building #1
3050 Coronado Drive
Santa Clara, California

2.0 STATEMENT OF BASIS AND PURPOSE

This Record of Decision ("ROD") presents the selected remedial actions for the Synertek Building #1 (Synertek #1) Superfund site in Santa Clara, California. This document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), 42 U.S.C. Section 9601 et. seq., and in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Section 300 et. seq., ("NCP"). The attached administrative record index (Attachment B) identifies the documents upon which the selection of the remedial action is based.

3.0 ASSESSMENT OF THE SITE

Actual or threatened release of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

4.0 DESCRIPTION OF THE REMEDY

The selected remedy for Synertek #1 consists of continuing to operate the current groundwater extraction system, treating contaminated water with the existing air stripper, and discharging treated effluent to a storm drain under an NPDES permit. The air stripper will include air emissions control if emissions exceed levels currently permitted by the Bay Area Air Quality Management District (BAAQMD). In addition, the selected remedy involves a pilot injection study to evaluate whether injection of treated water back to the subsurface would enhance the removal of pollutants, speed the cleanup, and reduce the amount of ground water discharged to the surface. Finally, attempts to locate and seal the remaining abandoned agricultural well that is believed to exist in the vicinity of the plume will continue. Contaminated soils and structures were removed during the interim remedial action and no further removals are necessary.

These remedial actions address the principal risks at the Synertek site by removing the contaminated soils and structures and removing the contaminated ground water, thereby significantly reducing the the toxicity, mobility or volume of hazardous substances in both media. These response actions will greatly reduce the possibility of contamination of existing potable water supplies and potential future water supplies.

5.0 DECLARATION

The selected remedy is protective of human health and the environment, complies with federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because the remedy will result in hazardous substances remaining on-site above health-based levels, a five-year review, pursuant to CERCLA Section 121, 42 U.S.C. Section 9621, will be conducted at least once every five years after initiation of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Daniel W. McGovern | 6.28.91

Daniel W. McGovern
Regional Administrator

Date

PART II. DECISION SUMMARY

This Decision Summary provides an overview of the problems posed by the Synertek Building #1 (Synertek #1) Superfund site, the remedial alternatives, and the analysis of the remedial alternatives. This Decision Summary explains the rationale for the remedy selection and how the selected remedy satisfies the statutory requirements.

1.0 SITE NAME, LOCATION, AND DESCRIPTION

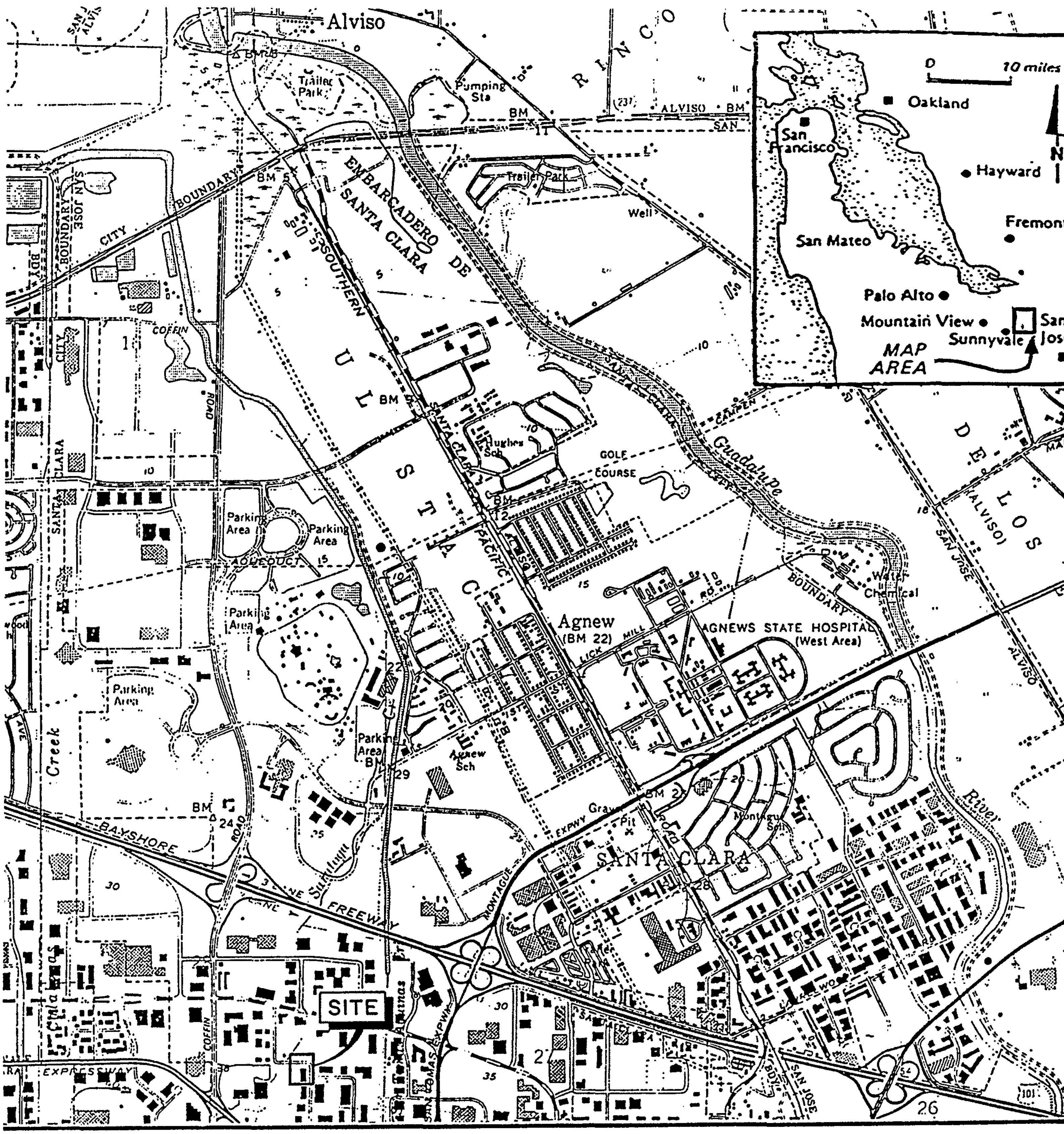
1.1 SITE NAME AND LOCATION

Synertek, Building #1
3050 Coronado Drive
Santa Clara, California

The former Synertek #1 facility is located in Santa Clara County about 6 miles south of the southern tip of San Francisco Bay near San Jose, California (Figure 1). The Synertek #1 Superfund site has an on-site and an off-site component within the Superfund site boundaries. The on-site component consists of the area within the Synertek property boundaries surrounding Building #1 (Figure 2). The off-site component includes the area located above the portion of the contaminated groundwater plume that has migrated north past the property boundaries and into the adjacent industrial park area.

1.2 REGIONAL TOPOGRAPHY

The Study Area is located in the Santa Clara Valley which is a gently sloping alluvial plain, flanked by the Diablo Range to the east-southeast and the Santa Cruz Mountains to the west-southwest. The Study Area is located toward the center of the valley. The Santa Cruz Mountains are located several miles southwest of the Study Area. San Francisco Bay is located approximately 6 miles north of the Study Area.



SOURCE: USGS TOPOGRAPHIC MAP
MILPITAS, CALIF. QUADRANGLE

SCALE: 1" = 2000'

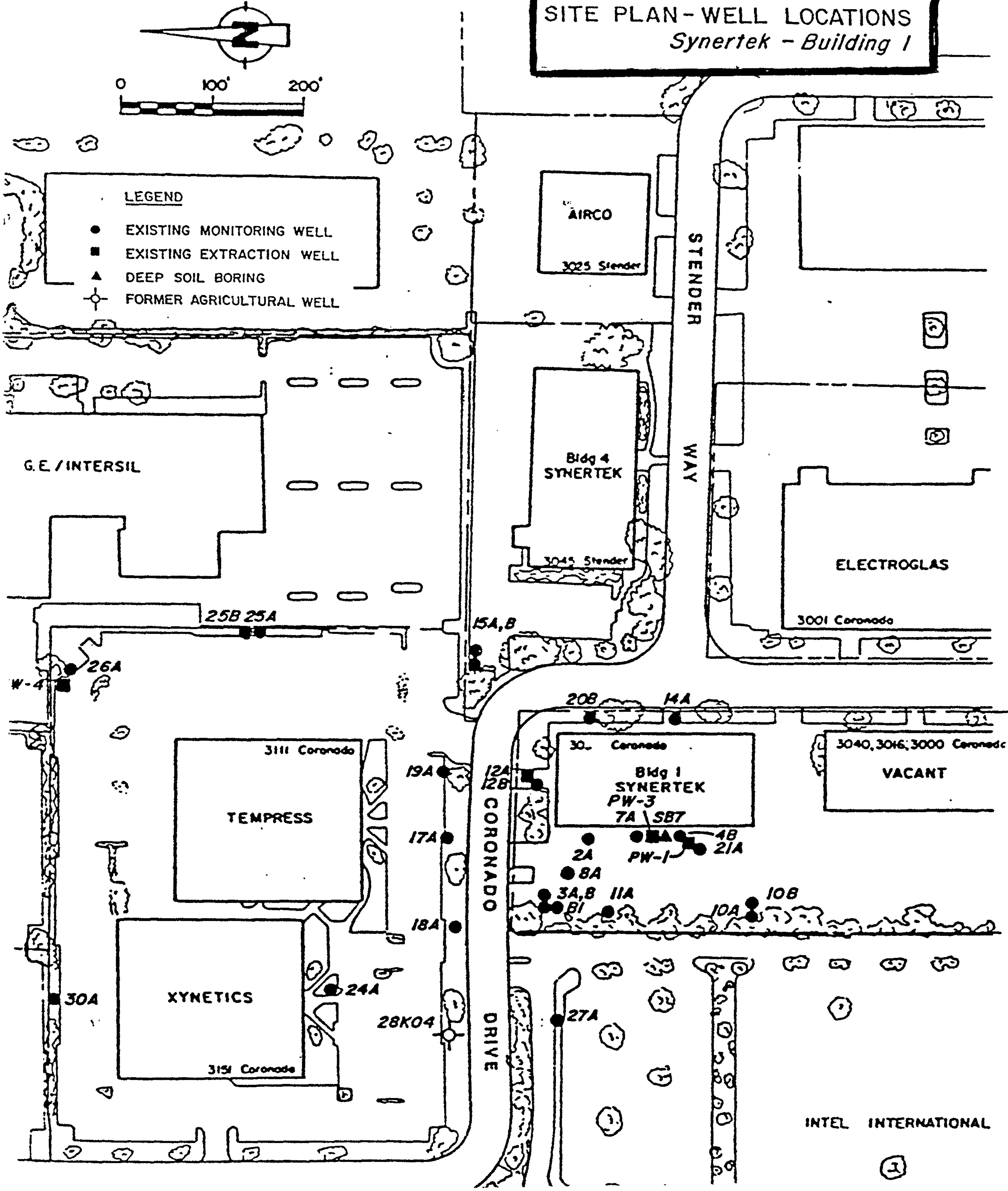
0 1000 2000 feet

figure I
SITE LOCATION
Synertek Building I

figure 2

SITE PLAN-WELL LOCATIONS

Synertek - Building 1



1.3 ADJACENT LAND USE

Synertek #1 is located in the City of Santa Clara in a relatively flat lying portion of the Santa Clara Valley. Ground surface elevations are generally between 27 feet and 35 feet above mean sea level. Synertek is in an industrial park setting, dominated by the electronics industry, particularly semiconductor manufacturing. As such, the majority of the area is developed, with large paved areas for streets and parking lots (Figure 2). Surface water is controlled by the storm sewer system which directs run-off to San Tomas Aquino Creek. The nearest residential areas are located 3600 feet south of the site. Other residential areas are located 6000 feet north-northeast of the site. None of these residential areas are within the area affected by the past chemical releases from Synertek.

1.4 HISTORICAL LAND USE

The land in the area occupied by Synertek #1 was in agricultural use until 1974 when Synertek, Inc. began operation as a semiconductor manufacturing firm. Honeywell Inc. acquired Synertek as a wholly owned subsidiary in 1979. Synertek manufactured semiconductor products in Synertek Building #1 from March 1978 to February 1985. The RREEF Funds is the current owner of the property and leases it to two tenants (Media Publications, Inc. and Westmar Printing Company).

1.5 HYDROGEOLOGY

Three shallow aquifer zones have been identified beneath the site. These zones are designated as the A, B, and B1 Aquifer Zones (Figure 3). The A, B, and B1 Aquifer Zones are subdivisions of the regional Upper Aquifer Zone. The Lower Aquifer Zone occurs beneath a regional aquitard that occurs at depths ranging from about 100 feet to about 150 to 250 feet. Thickness of this regional aquitard varies from about 20 feet to over 100 feet. Numerous individual aquifers occur within this predominantly aquitard zone and all ground water in this zone occurs confined.

Within the regional aquifer zones, the A Aquifer Zone is the shallowest and has its upper boundary at about 10 feet below ground surface (BGS), and the lower boundary about 20 feet BGS. The B Aquifer Zone lies between about 30 and 40 feet BGS. The two zones are separated by a 2 to 10 feet thick aquitard composed of clay to silty sand. It is suspected that hydraulic separation between the two zones is imperfect owing to the discontinuous nature of sediment types. The deeper B1 Aquifer Zone lies between 100 and 108 feet BGS. The stratigraphy below 108 feet consists

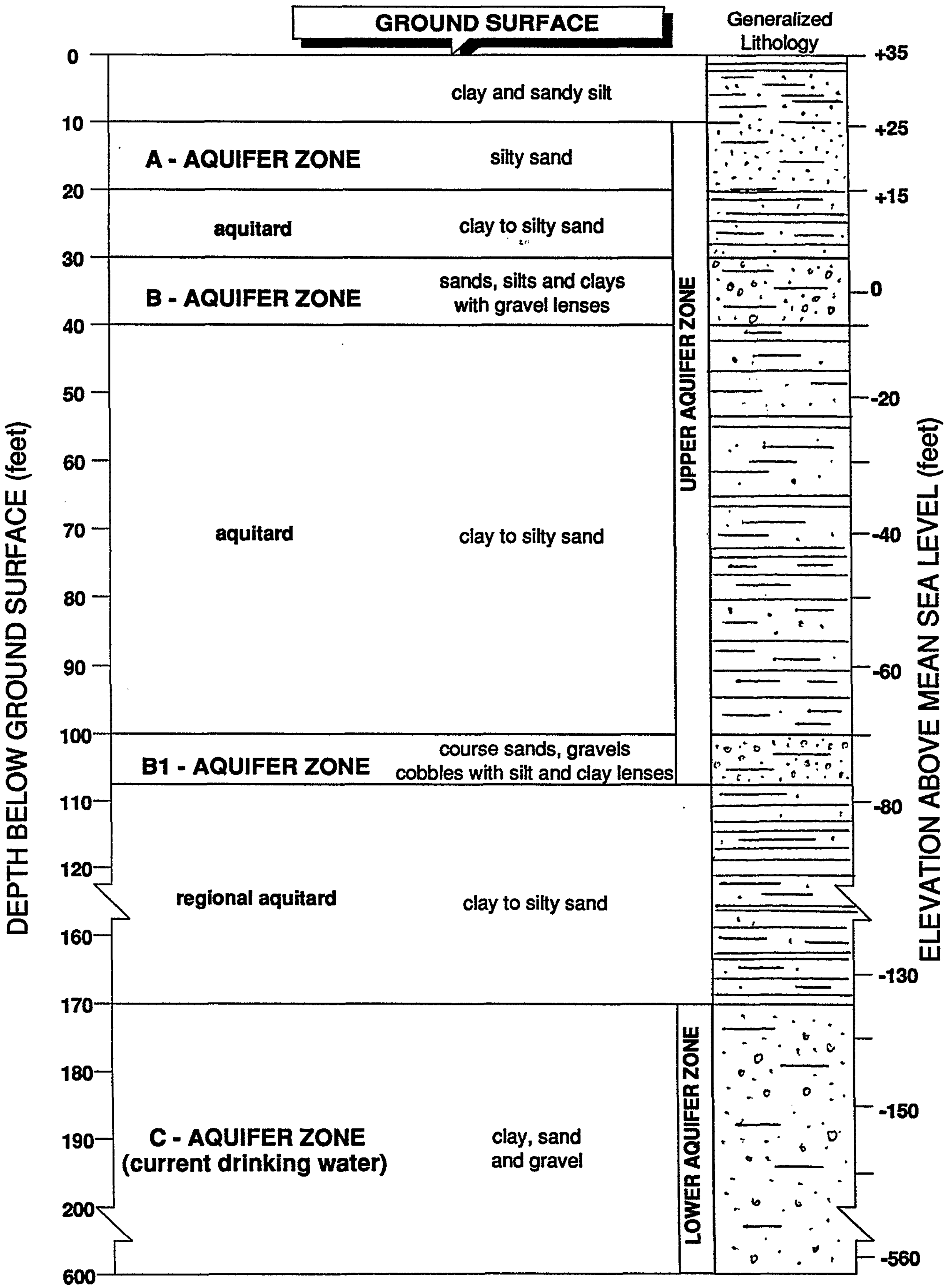


Figure 3: Generalized Hydrogeologic Profile, Synertek #1

of clay to 171 feet. Below 171 feet is a sequence of sands, clays and gravels that are believed to make up the lower aquifer zone below the site. Shallow groundwater flow in the A and B Aquifer Zones beneath the site is generally to the north. This flow regime is consistent with the northerly regional flow towards San Franciso Bay.

1.6 WATER USE

Prior to the construction of public water connections and municipal water supply wells, groundwater use in the area of the Synertek site included private water-supply wells for homes and agriculture. Two well searches for abandoned agricultural wells located within 1 mile of the site identified 56 wells. Of the identified wells, 23 are shallow groundwater extraction wells and 31 are deep former agricultural wells that are located at least 800 feet laterally beyond the contaminated ground water at the site. The remaining 2 deep agricultural wells are near the Synertek site; one has been located and sealed and the other is still under investigation.

The site overlies the Santa Clara Valley groundwater basin. Ground water from this basin provides up to 50% of the municipal drinking water for the 1.4 million residents of the Santa Clara Valley. In 1989, ground water accounted for approximately 128,000 of the 315,000 acre feet of drinking water delivered to Santa Clara Valley Water District customers. Synertek #1 was listed on the National Priorities List (NPL) primarily because of the potential threat from past chemical releases to the quality of this valuable resource. The major concern at the site stems from the potential migration of contaminants in the Upper Aquifer Zone down to the Lower Aquifer Zone through abandoned or poorly sealed wells or natural conduits through aquitard material.

Municipal water supply wells are generally perforated in the Lower Aquifer Zone. Perforated intervals in City of Santa Clara water supply wells located within 2 miles of Synertek #1 begin from 250 to 320 feet below ground surface. Currently, the nearest municipal drinking water supply well downgradient of the site is the City of Santa Clara's Well No. 33, which is located 1.6 miles north of the site. No pollutants have been found in this well to date.

Currently, there are no known users of ground water from the Upper Aquifer Zone. The Regional Water Quality Control Board (RWQCB) has identified potential beneficial uses of the shallow ground water underlying and adjacent to the Synertek site. These beneficial uses include industrial process water supply, industrial service water supply, municipal and domestic water supply and agricultural water supply. These are the same as the existing and potential beneficial uses of the ground water in the Lower Aquifer Zone.

1.7 SURFACE AND SUBSURFACE STRUCTURES

Synertek Building #1 is approximately 24,000 square feet in size and the property covers approximately 1.5 acres. The site and surrounding area is zoned for light industrial manufacturing operations and, with the exception of minor landscaping, the site consists of streets, paved areas, and buildings. Figure 2 shows the location of existing monitoring and extraction wells at the site.

Prior to 1985, Synertek constructed and operated two underground tank systems east of the building (Figure 4). Solvent Tank [A] had a capacity of 200 gallons and was used for storing solvents between 1976 and 1982. Three former neutralization system tanks [B] were used between 1974 and 1982 as holding tanks. These tanks stored a variety of chemicals including solvents. The quantity of contaminants released by these tanks and the dates of the releases are unknown. These tanks along with affected soils were removed in the Spring of 1985.

An underground concrete vault was constructed in the summer of 1982 to be used for process water neutralization. The approximate depth of the vault was 14 feet BGS. Neutralization operations continued until 1985 when manufacturing operations at Synertek ceased. In April 1990, demolition and excavation of the neutralization system was completed. There were no clear indications that this newer neutralization system was a source of groundwater or soil contaminants.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 HISTORY OF SITE ACTIVITIES

The land in the area occupied by Synertek #1 was in agricultural use until 1974 when Synertek, Inc. began operation as a semiconductor manufacturing firm. Honeywell Inc. acquired Synertek as a wholly owned subsidiary in 1979. Synertek manufactured semiconductor products in Synertek Building #1 from March 1978 to February 1985. A variety of solvents were used in the manufacturing process and some were stored with other chemicals in underground tanks or vaults (see Section 1.7). Wastewater from the underground neutralization system was discharged to the sanitary sewer. Two of the three tank systems were removed in 1985. The building was vacant from 1985 until 1989, when it was leased to Media Publications, Inc. and Westmar Printing Company.

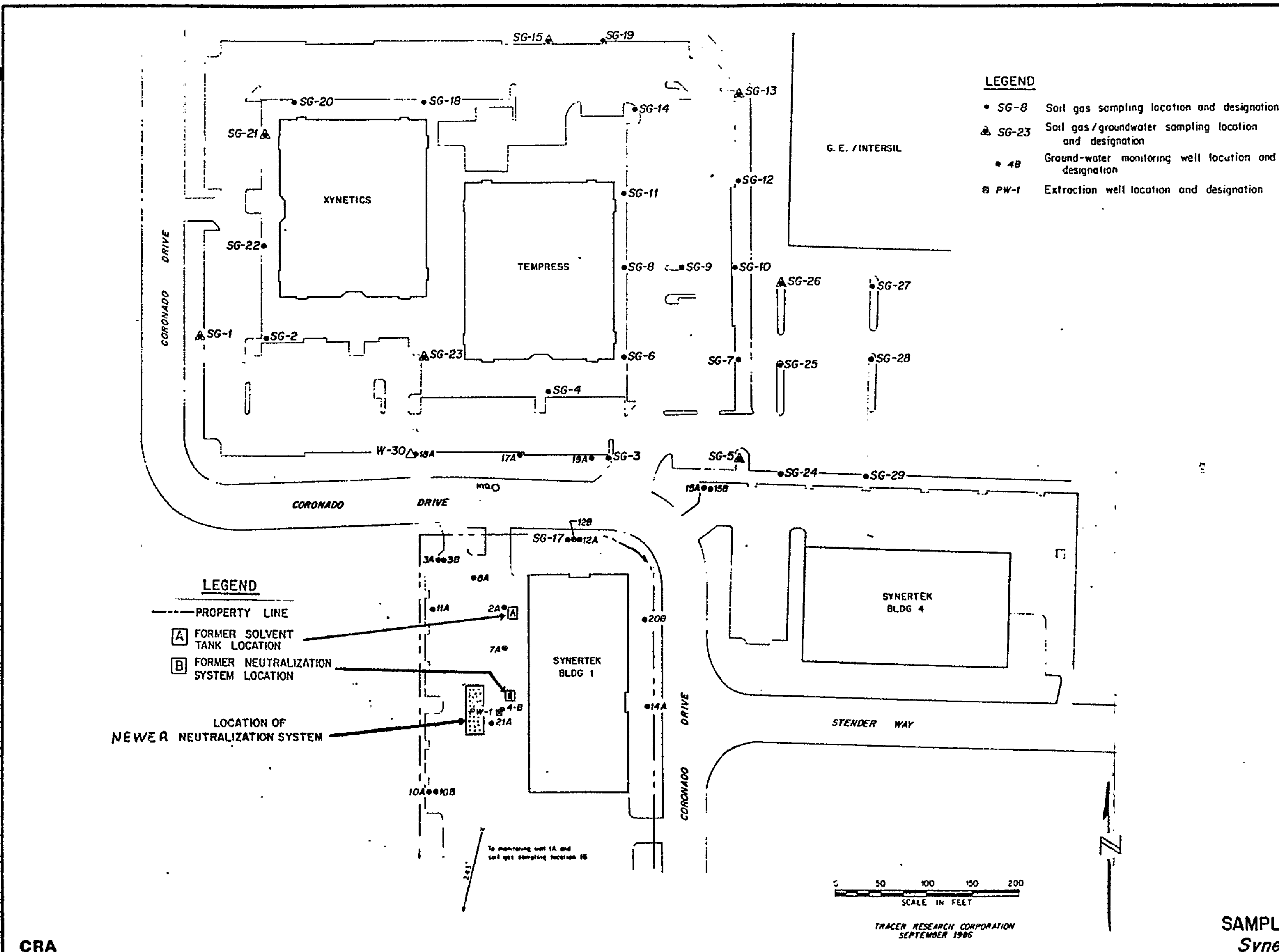


figure 4
SOIL GAS
SAMPLING LOCATIONS
Synertek Building I

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2.2 HISTORY OF SITE INVESTIGATIONS

In 1982, Synertek submitted a Facility Questionnaire to RWQCB staff describing Synertek #1's underground neutralization systems, sumps, and tanks. Based on these submittals, RWQCB staff required initiation of subsurface pollution characterization at Synertek #1 in 1982. This remedial investigation (RI) type work has been ongoing for the last eight years. Sampling results from these investigations are described in Section 5.2. Interim remedial actions began at Synertek #1 in 1985 with the excavation and removal of the solvent tank and the neutralization tanks. The additional interim remedial actions of groundwater extraction and treatment began at Synertek #1 in 1987. These interim actions were performed at RWQCB request and are described in Section 4.1.

In 1985, Conestoga-Rovers and Associates were retained by Honeywell to assist in the investigation. Studies continued to define the horizontal and vertical extent of solvent plumes in the shallow ground water at the site. Soil contamination was studied near the excavation sites. A well search for abandoned agricultural wells within 1/2 mile of the site was conducted in February 1986. The search was extended to one mile north of the site in November 1989. A formal RI workplan was approved in June 1989. The final version of the RI was submitted in October 1990. The feasibility study (FS) evaluated the interim remedial actions that have been ongoing for the last three years and alternatives for the final remedial action. The RI/FS reports summarize the last eight years of the RI and the last five years of the interim remedial actions. The final version of the FS was submitted in January 1991.

2.3 HISTORY OF ENFORCEMENT ACTIONS

Synertek #1 has been under RWQCB orders since 1987. Honeywell and The RREEF Funds are the only identified responsible parties associated with the release of pollutants at this site. Honeywell has accepted responsibility for the site cleanup. The summary of the enforcement history for the site is as follows:

* Oct. 6, 1982 — Synertek submitted completed RWQCB Facility Questionnaire
* May 20, 1987 — RWQCB adopted National Pollution Discharge Elimination System (NPDES) Permit No. CA0029211 (Order No. 87-050) for the discharge of extracted ground water
* July 15, 1987 — RWQCB adopted Order No. 87-084 issuing Site Cleanup Requirements
* June 1988 — EPA proposed Synertek #1 for the NPL

* June 21, 1989 RWQCB adopted Order No. 89-134 amending Site Cleanup Requirements and approving the RI/FS workplan

* Sept. 1989 EPA listed Synertek #1 on the NPL

* March 1991 RWQCB adopted Order No. 91-051 issuing the Final Remedial Action Plan

3.0 COMMUNITY RELATIONS

An aggressive community relations program has been ongoing for all Santa Clara Valley Superfund sites, including Synertek #1. The RWQCB published a notice in the Santa Clara Valley Weekly on January 9, 1991 and January 16, 1991, announcing the Proposed Plan and the opportunity for public comment at the Board Hearing of January 16, 1991 in Oakland. The notice also announced the opportunity for public comment at an evening public meeting held at the Bracher Elementary School in the City of Santa Clara on January 17, 1991. A presentation of the proposed final cleanup plan was made at both meetings. The 30-day comment period was from January 16, 1991 to February 18, 1991.

Fact Sheets were mailed to interested residents, local government officials, and media representatives. Fact Sheet 1, mailed in January 1990, summarized the pollution problem, the results of investigations to date, and the interim remedial actions. Fact Sheet 2, mailed in January 1991, described the cleanup alternatives that were evaluated and explained the Proposed Plan. Fact Sheet 2 also announced the opportunity for public comment at the Board Hearing in Oakland on January 16, 1991 and at the Public Meeting in Santa Clara on January 17, 1991. In addition, this fact sheet described the availability of further information at the Information Repository at the City of Santa Clara Public Library. A Responsiveness Summary was prepared to address significant comments received during the public comment period and appears in Part III of this ROD. A future fact sheet will explain the Final Cleanup and Abatement Order adopted by the RWQCB.

4.0 SCOPE AND ROLE OF THE RESPONSE ACTION

4.1 SCOPE OF THE RESPONSE ACTION

The remedy selected and described in this ROD includes existing interim remedial actions as well as additional remedial actions selected for the Synertek #1 site. The interim remedial actions include the removal of all leaking underground structures and associated contaminated soils, and operation of the current extraction and treatment systems in the A and B Aquifer Zones. The additional remedial actions require Honeywell to conduct a pilot injection study to evaluate whether injection of treated water back into the subsurface would enhance the removal of pollutants, speed the cleanup, and reduce the amount of ground water discharged to the surface.

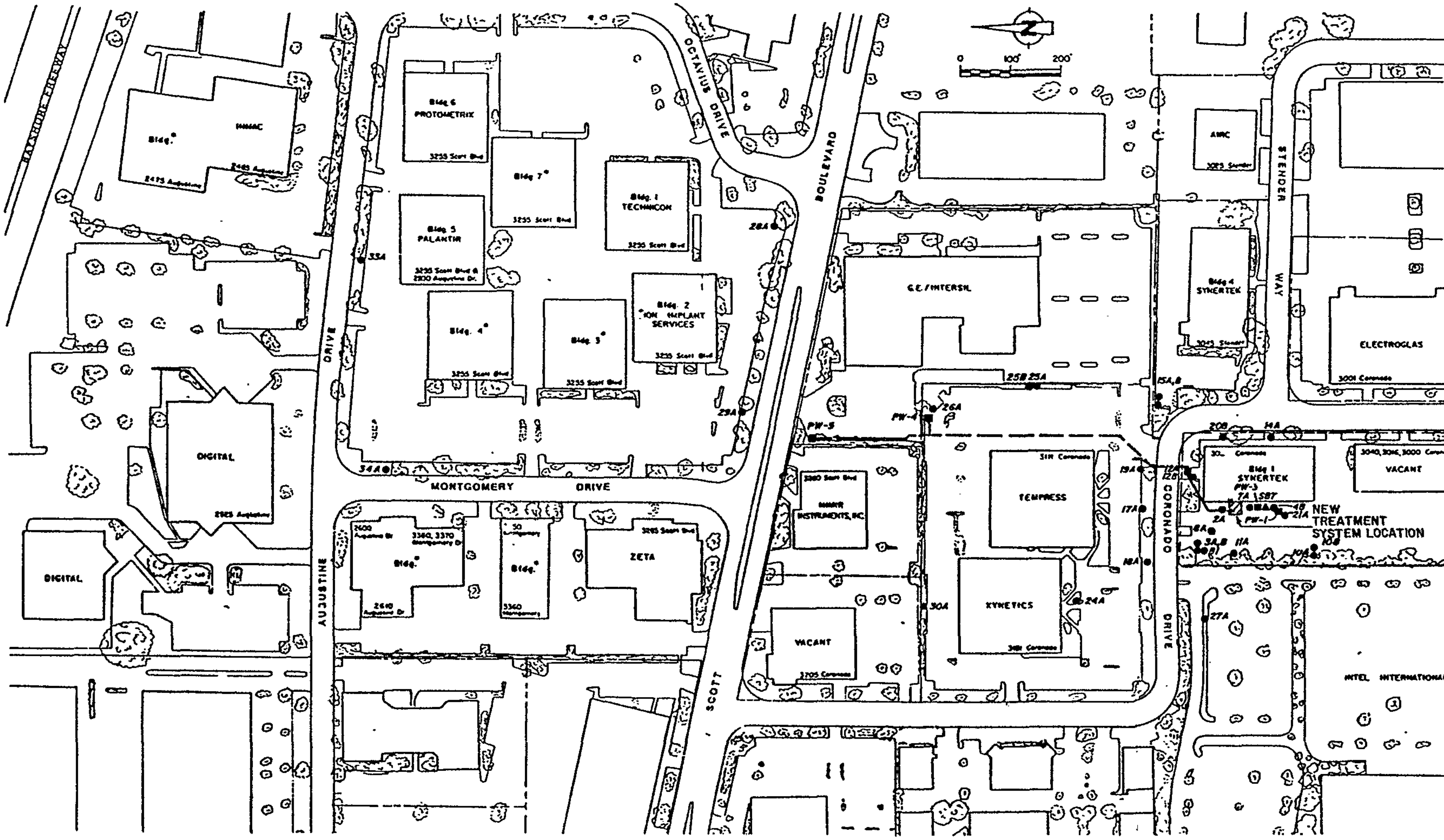
4.1.1 Current Interim Remedial Measure (IRM)

Honeywell began operating an on-site groundwater extraction and treatment system in June 1987. The current system (Figure 5) consists of two groundwater extraction wells in the A Aquifer Zone (PW1 and 12A) which remove water at a combined rate of 6 gallons per minute (gpm), and one well in the B Aquifer Zone (PW3) which extracts groundwater at approximately 4 gpm. Extracted water is treated using an air stripping tower. Treated water is then discharged under an NPDES permit to the storm sewer which flows to the San Tomas Aquino Creek.

The off-site IRM consists of two A Aquifer Zone extraction wells (PW4 and PW5) which were installed in the fall of 1988. These extraction wells pump at a combined rate of approximately 6 gpm and are connected by a forcemain to the on-site air stripping facility. After treatment in the air stripper, the ground water is discharged to San Tomas Aquino Creek under an existing NPDES permit. Figure 5 shows the layout of the off-site and on-site remediation system.

An attempt was made to convert monitoring well 4B into a B Aquifer Zone extraction well. However, well 4B was not effectively preventing fine grained formation materials from entering the well under pumping conditions and was shut down. A replacement well (PW3) was installed in December 1987, approximately 18 feet north of 4B. Well 4B continues to be used as a monitoring well.

The treatment system is a versatile two-tower air stripping facility which is connected-in-series mode. Under this type of operation, influent volatile organic compound (VOC) concentrations were reduced 99.9 percent prior to discharge to comply with the NPDES permit requirements. Scaling problems in the towers



LEGEND

- ● EXISTING MONITORING WELL
- ■ EXISTING EXTRACTION WELL
- ▲ DEEP SOIL BORING
- ——— ON-SITE IRMs
- – – – OFF-SITE IRMs

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figure 5
REMEDIATION SYSTEM LAYOUT
Synertek - Building I

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required the installation of a pH control system in December 1988. The influent ground water was reduced to a pH of 6.0 using hydrochloric acid.

At the request of the current tenants at the Synertek facility, the treatment system was shut down from July to December 1989 for reinstallation at a new location. Prior to starting the system back up, the treatment system was modified to allow single tower treatment of water with the other tower in a standby mode. This action was prompted by the decreasing VOC concentrations from ongoing remediation. In the event that influent concentrations increase, the standby tower may be used for two tower operation.

4.1.2 Selected Remedy

The selected remedy for Synertek #1 consists of continuing to operate the current groundwater extraction system, treating contaminated water with the existing air stripper, and discharging treated effluent to a storm drain under an NPDES permit. The air stripper will include air emissions control if emissions exceed levels permitted by the BAAQMD.

In addition, the selected remedy involves a pilot injection study to evaluate whether injection of treated water back to the subsurface would enhance the removal of pollutants, speed the cleanup, and reduce the amount of ground water discharged to the surface. If the injection study shows that injecting water into the B Aquifer Zone is feasible, then additional extraction wells may be necessary to capture the injected water. If the injection study shows that reinjection into the B Aquifer Zone is not feasible, then an additional B Aquifer Zone extraction well or wells will be required to ensure complete containment and capture of the plume.

Finally, Honeywell will continue its attempts to locate and seal the remaining abandoned agricultural well that is believed to exist in the vicinity of the plume.

4.2 ROLE OF THE RESPONSE ACTION

The selected remedy addresses ground water in the Upper Aquifer Zone and the principal threats posed by the contamination in soils. The principle risks are: further lateral migration of the plume emanating from the Synertek site; potential vertical migration of contaminated ground water into the Lower Aquifer Zone; ingestion and inhalation of contaminants in the ground water from the Upper Aquifer Zone; ingestion and inhalation of contaminants in the contaminated soil; and inhalation of chemicals volatilized from contaminated ground water.

The objective of the selected remedy is to remove and permanently destroy the contaminants from both soils and ground water or to significantly reduce the toxicity, mobility or volume of hazardous substances in both media. These response actions will greatly reduce the possibility of contamination of current and potential water supplies.

5.0 SUMMARY OF SITE CHARACTERISTICS

5.1 SOURCES OF CONTAMINATION

Soil and shallow groundwater contamination are attributed to the accidental release of chemicals stored in two underground tank systems located east of Synertek #1 (Figure 4). Unknown quantities of solvents and a variety of other chemicals leaked from these systems sometime during their operational period of 1974 to 1982. These tanks along with adjacent contaminated soils were removed in 1985.

An underground concrete vault was constructed in 1982 near the earlier-constructed underground tank systems (Figure 4) and was used for process water neutralization until 1985. During removal of this newer system in 1990, there were no indications that it acted as a source of groundwater or soil contamination.

5.2 DESCRIPTION OF CONTAMINATION

5.2.1 Subsurface Structures/Soil Investigations

Subsurface structures that acted as sources of groundwater and soil contaminants consisted of a solvent tank [A] and the former neutralization system tanks [B] as shown in Figure 4. The 200-gallon-capacity solvent tank was used for storing trichloroethylene (TCE) and 1,1,1-trichloroethane (TCA) between 1976 and 1982. During the period of 1974 to 1982, the former neutralization system contained three tanks that held xylene, N-butyl acetate, Burmar™ 712D (containing 1,2,4-trichlorobenzene and phenol), methyl alcohol, isopropanol, Freon, TCE, TCA, and ethylene glycol monoethylether acetate.

Solvent tank [A] and associated soils were excavated in 1985 from an area approximately 6 feet long by 3-1/2 feet wide by 5 feet deep. The excavated area was free of ground water. Soil samples were then collected from the north, south and middle of the excavation base and analyzed for volatile and semi-volatile priority pollutants. The highest priority VOC concentration was 94 parts per billion (ppb) TCA. Most samples were less than 20 ppb for individual contaminants. Based on these low concentrations, no further soil removal was performed.

The former neutralization system [B] and associated soils were excavated in 1985 from an area approximately 20 feet long by 9-1/2 feet wide by 10 feet deep. Soil samples were collected from the walls of the excavation and analyzed for VOCs. TCA was present at about 20 to 40 ppb and TCE was present in two samples at about 20 ppb. All other VOCs were detected at less than 3 ppb each. Based on these low concentrations, no further soil removal was performed.

Metals were considered to be unlikely contaminants based on manufacturing practices. Any metals that might have leaked from the tank or neutralization system would not have migrated as far as the solvents and would have been removed in the excavated soils.

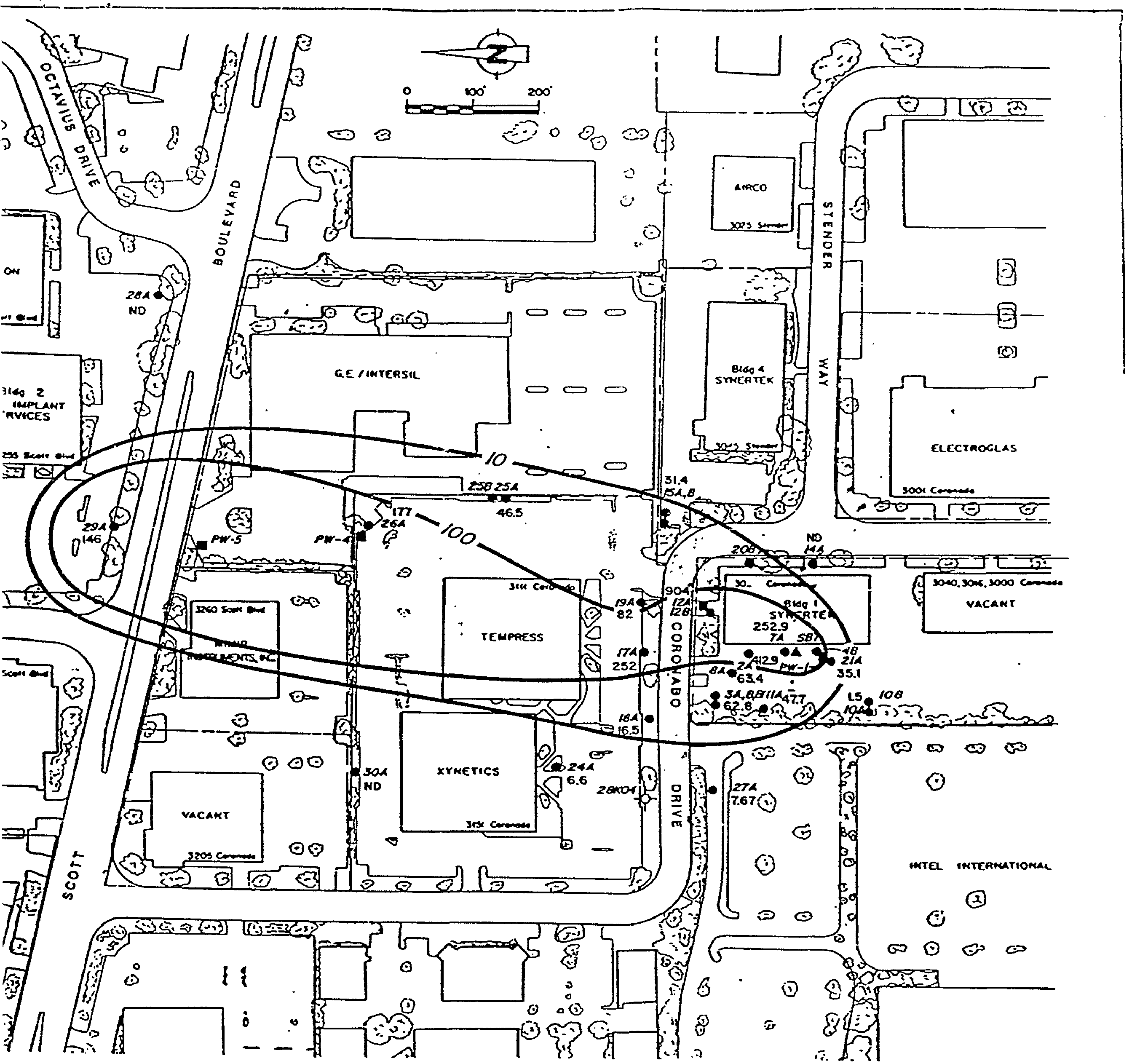
The newer neutralization system was excavated in 1990 and was found to be intact and water-tight. Ground water had not accumulated in the vault until after the sides were damaged during removal. Analysis of the adjacent ground water for heavy metals and VOCs supported the conclusion that this system had not released contaminants to the surrounding ground water or soil.

Abandoned agricultural wells could act as conduits from the Upper Aquifer Zone down to deeper aquifers. Based on available records and results of a well survey, only one such well remains unaccounted for within close proximity to the plume; well No. 6S1W28J01, located approximately 1,100 feet North of Synertek Building #1, is listed as destroyed with no record of sealing. Attempts to locate it have thus far been unsuccessful. Honeywell has used both a metal-pipe locating company and a proton-precession magnetometer survey in attempts to locate this well, and currently plans on extending the magnetometer survey.

5.2.2 Groundwater Investigations

The A Aquifer Zone contains a contaminant plume that extends north 1,400 feet downgradient from the site (Figure 6) as determined by 24 monitoring wells. Ground water in this zone is moving at a rate of 150 to 254 feet per year. The actual distance traveled by the leading edge of the VOC plume (10 ppb contour) is consistent with the distance predictable from the groundwater flow rate and likely contaminant release dates.

The B Aquifer Zone contains a smaller contaminant plume (Figure 7) believed to be caused by vertical migration from the A Aquifer Zone through borehole 4A starting in 1982. The borehole was properly sealed in 1988. The plume is moving north at a rate of about 20 feet per year and extends 250 feet downgradient from the site as determined by 7 monitoring wells. Both the A and B Aquifer Zones eventually discharge to wetlands located 13,000 feet north of the site.



LEGEND

- ● EXISTING MONITORING WELL
- ■ EXISTING EXTRACTION WELL
- ▲ DEEP SOIL BORING
- 351 TOTAL VOC CONCENTRATION (μg/L) 9-89
- FORMER AGRICULTURAL WELL

figure 6
TVOC CONTOURS
IN A AQUIFER
Synertek – Building 1

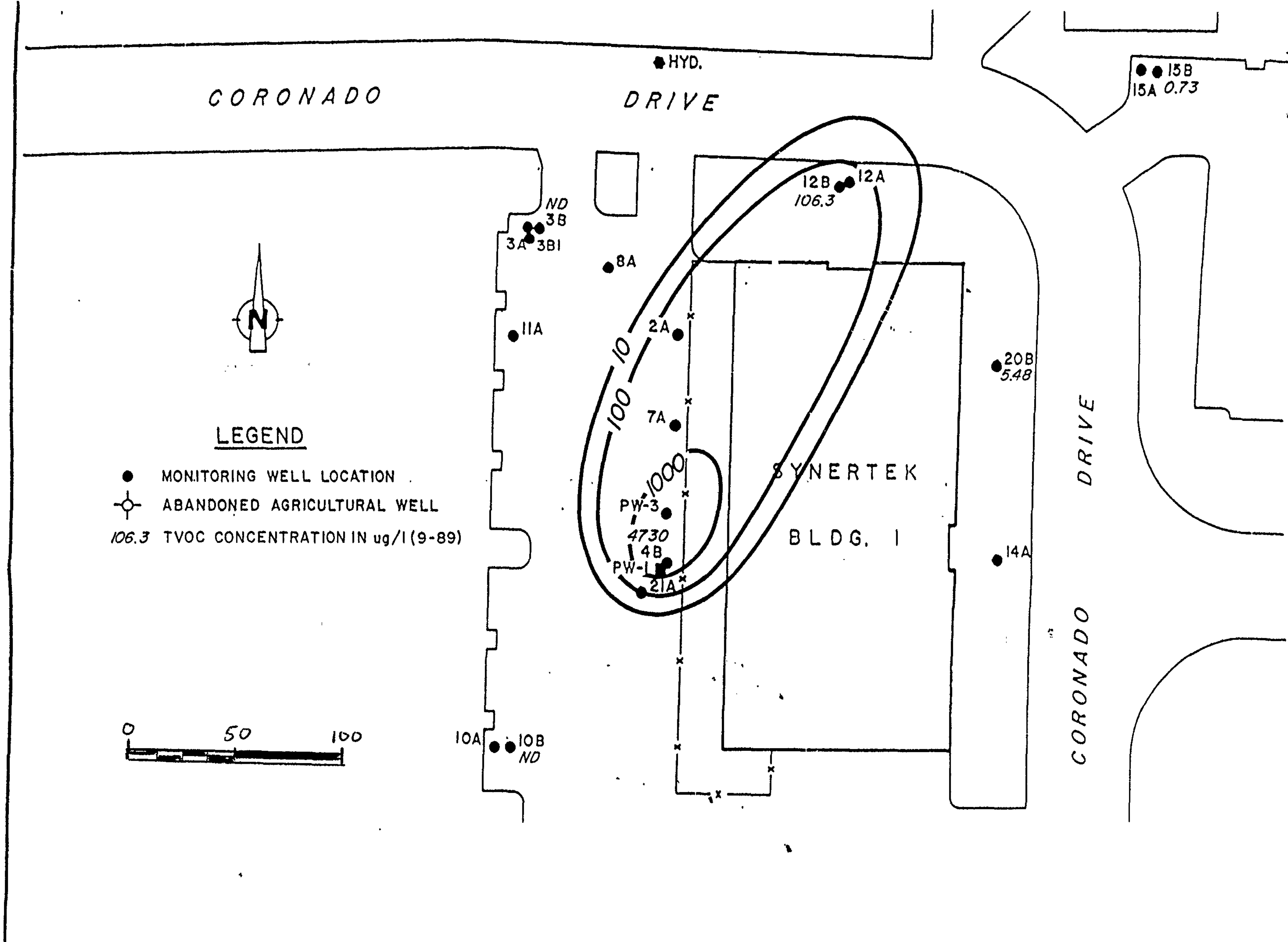


figure 7
TVOC CONTOURS IN B AQUIFER
Synertek Building 1

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The B1 Aquifer Zone has not been contaminated as determined by non-detectable levels of VOCs in all samples from the one monitoring well that extends down into this zone. The presence of a 60-foot-thick aquitard (Figure 3) effectively prohibits migration from the B Aquifer Zone down to the B1 Aquifer Zone, although old abandoned agricultural wells (see Section 5.2.1) could penetrate this aquitard and provide a conduit to the B1 Aquifer Zone and deeper aquifers.

Significant groundwater contaminants that have been found in the contaminant plumes are listed in two groups in Table 1. The top group consists mainly of those VOCs that are major indicators of the extent of groundwater contamination. TCE and 1,1,1-TCA are the two most prevalent solvents based on their high frequencies of detection and high concentrations; their average detected concentrations are 709 ppb and 389 ppb respectively. Despite a currently lower prevalence and concentration, vinyl chloride is included in this group because of its high toxicity and likely presence as a degradation product of TCE and DCE.

The bottom group of groundwater contaminants listed in Table 1 consists of chemicals that were known to be stored in Synertek's underground storage tanks, are relatively toxic, or exceed a maximum contaminant level (MCL). They have relatively low freqencies of detection and much lower concentrations than chemicals in the top group.

5.2.3 Air Investigations

Volatilization of groundwater contaminants from the subsurface has not been investigated in a detailed manner because concerns for the significance of this transport pathway arose after completion of the RI, and widely accepted methodology for studying this problem are still being developed. The affects of this volatilization on air quality at the Synertek #1 site are expected to be minimal based on the following preliminary findings. Emission of the volatilized contaminants from the soil to surface air or dwellings might be significantly retarded since ten feet of low permeability clay soil overlay the ground water. Currently, no residences exist above or adjacent to the plume.

Soil gas and soil gas/groundwater data were collected from various locations (Figure 4). The elevated concentrations tend to correlate in area with the contaminant plumes. This suggests that VOCs volatilize from the ground water in the soils pore space, as would be expected. Reported concentrations were quite variable, but the average concentration detected for TCE was 0.05 micrograms per liter.

Emissions from the air stripper that is currently used as part of the interim remedial action are regulated under a permit issued by the BAAQMD. Because the site is located in an "ozone non-attainment area," an evaluation of treatment system emissions was conducted. The system emitted a maximum of 0.56 pounds of VOCs

Table 1 Significant Groundwater Contaminants, Synertek #1

Contaminant		Frequency of Detection		Concentration (ppb)	
Chemical Name	Abbreviation	No. Detects/No. Samples	Percent	Average of Detections	1989 Maximum
trichloroethylene	TCE	211/306	69	709	33,000
1,1,1-trichloroethane	TCA	252/308	82	389	25,000
1,1,1-trichloro-1,2,2-trifluoroethane	Freon 113	141/254	56	131	1,900
1,1-dichloroethane	1,1-DCA	245/308	80	67	1,400
1,1-dichloroethylene	1,1-DCE	230/308	75	49	800
cis 1,2-dichloroethylene	cis 1,2-DCE	32/97	33	10	55
vinyl chloride	VC	23/300	8	15	40
xylenes		15/92	16	74	84
ethylbenzene		11/89	12	15	54
1,2,4-trichlorobenzene		10/61	16	21	39
Bis(2-ethylhexyl)phthalate		14/104	14	7	16
benzene		5/83	6	3	4
phenol		5/61	8	2	3

per day in June 1987 during system start-up after initial permitting by BAAQMD. At present, approximately 0.05 pounds of VOCs are emitted daily, which is typical of emissions since January 1989.

6.0 SUMMARY OF SITE RISKS

6.1 TOXICITY ASSESSMENT

Chemicals of potential concern are listed in Table 2 along with their toxicological classification, concentration in ground water, and frequency of detection. These 33 chemicals were used in the baseline public health evaluation because they were detected with a frequency of greater than 5% or, in the case of vinyl chloride, are a known human carcinogen. Metals and 10 other VOCs were considered unlikely chemicals of concern and were not further evaluated for risk.

Indicator chemicals were identified from approximately 43 chemicals detected at the site. The 7 indicator chemicals are as follows:

trichloroethylene (TCE)
1,1,1-trichloroethane (1,1,1-TCA)
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)
1,1-dichloroethane (1,1-DCA)
1,1-dichloroethylene (1,1-DCE)
cis 1,2-dichloroethylene (1,2-DCE)
vinyl chloride (VC)

The reasons for selecting the listed chemicals as indicator chemicals are as follows:

1. Except for vinyl chloride, each of the indicator chemicals was consistently detected in at least 33% of the samples throughout the plume area in both the A and B Aquifer Zones. Table 1 lists detection freqencies for these compounds.

2. Each of the indicator chemicals possesses physiochemical properties (relatively high water solubility and relatively low soil sorption) which tend to promote their dispersion in ground water. In addition, they are all quite volatile and can easily escape into soil gas or the atmosphere.

3. Most of the indicator chemicals are potential carcinogens. Vinyl chloride is a known human carcinogen and TCE is a probable human carcinogen. Both 1,1-DCE and 1,1,1-DCA are

Table 2. Grountwater Contaminants of Concern, Synertek #1

Chemical	*Toxicol. Class* (1)	*Concentration (µg/L)* *Mean All Values* (3)	*95th Percentile*	*Mean of Detects*(4)	*Number of Analyses*	*Number of Detects* (5)
Acetone	NC	124	268	311	60	24
Benzene	PC A	1	1	3	54	5
Bis(2-ethylhexyl)phthalate	PC B2	2	3	7	98	14
1-Butanol	NC	3	5	10	11	2
3-Buten-2-one	NC	1	2	3	11	1
Butylbenzyl phthalate	PCC	2	2	1	52	3
Carbon disulfide	NC	1	1	2	18	2
1,1-Dichloroethane	PCC	38	63	29	211	159
1,1-Dichloroethylene	PCC	32	56	25	211	147
cis-1,2-Dichloroethylene	NC	10	17	10	99	32
Di-n-butyl phthalate	PC D	1	1	2	52	7
Ethanol	NC	22	50	59	11	4
Ethylbenzene	PC D	3	5	15	81	11
2-Methyl-2-Hexanol	NC	8	17	66	29	3
Hexanoic Acid	NC	38	66	38	11	11
Methyl ethyl ketone (MEK)	PC D	2	3	10	34	4
Methyl pentenone	NC	8	22	140	20	1
Oxiranemethanol	NC	3	8	13	6	1
4-OH-2-Methyl Pentanone	NC	29	52	113	20	5
4-OH-4-Methyl-2-Pentanone	NC	6	10	20	20	5
Phenol	NC	1	2	2	52	5
2-Propanol	NC	9	19	51	20	3
1-Propylamine	NC	5	13	23	8	1
Styrene	PCB2	3	6	7	9	4
Toluene	PC D	2	3	6	60	19
1,2,4-Trichlorobenzene	PC D	4	6	22	52	7
1,1,1-Trichloroethane	PC D	224	469	281	211	188
Trichloroethylene	PC B2 (2)	360	699	607	209	124
1,1,2-Trichloro-1,2,2-trifluoroethane	NC	58	92	84	204	106
1,1,2-Trifluoro-1,2-dichloroethane	NC	15	25	48	52	16
2,2,4-Trimethylpentane	NC	2	3	8	11	1
Vinyl Chloride	PC A (2)	19	42	3	212	2
Xylenes	PC D	4	8	17	89	15

(1) NC = Noncarcinogen
PC = Potential Carcinogen
EPA Weight of Evidence Rating:
- A = Known Human Carcinogen
- B1 = Probable Human Carcinogen (limited evidence in humans)
- B2 = Probable Human Carcinogen (sufficient evidence in animal studies)
- C = Possible Human Carcinogen (limited evidence in animal studies)
- D = Not Classified (Inadequate evidence of carcinogenicity in animal studies)
- E = No Evidence of Carcinogenicity in Humans (No evidence for carcinogenicity in at least two adequate animal studies)
- * From the USEPA Integrated Risk and Information System Database (IRISs); April 1990, and

(2) USEPA Superfund Public Health Evaluation Manual (SPHEM), EPA/54011-861060; October 1986.
- Values from this document are only included where no IRIS value has been confirmed.

(3) Average concentrations calculated by including positively detected results together with the non-detected results. Samples that were not detected were assumed to be equivalent to the detection limit.

(4) Average concentrations calculated by including only positively detected results.

(5) Number of Detects = Number of field samples which showed detectable concentrations of that parameter

possible human carcinogens based on limited evidence in animal studies. TCA remains unclassified as a potential carcinogen because there is inadequate evidence of its carcinogenicity in animal studies. Freon 113 and cis 1,2-DCE are non carcinogens.

4. TCE, 1,1,1-TCA, and Freon 113 were among the chemicals stored in leaking underground tanks at Synertek Building #1. The 1,1-DCA is a potential breakdown product of the major plume contaminant, 1,1,1-TCA. The most common plume contaminant, TCE, breaks down into DCE and ultimately vinyl chloride.

6.2 RISK CHARACTERIZATION

Synertek contaminants could reach humans through a variety of exposure pathways. Soil, subsurface structures, air, surface water, and ground water were all considered as potential sources, transport media, and human exposure points. Risks were characterized for pathways involving these media in the following subsections. As described in the National Contingency Plan, the EPA acceptable cancer risk range is 1×10^{-4} to 1×10^{-6} for exposure to known or suspected carcinogens at concentration levels that represent an excess upper bound lifetime cancer risk to an individual. For noncarcinogenic effects, the Hazard Index (HI) provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. EPA considers an HI less than 1.0 to be acceptable.

6.2.1 Soil/Subsurface Structures

The original sources of environmental contamination were leaking underground storage tanks and adjacent soils. These sources have been removed as part of the interim remedial action. The soil sampling results in the excavations, after removal of the tanks and contaminated adjacent soils, indicate concentrations were in the low ppb range. Hence, soil concentrations are considered negligible and of no environmental or health concern. Because the source of contamination was subsurface tanks, surface soils were not affected and are not a source of chemical exposure. Soil at a depth which was adjacent to the buried tanks and potentially contaminated soil was removed at the time of the tank removal. The excavations were then back-filled and repaved with asphalt.

6.2.2 Air

The only remaining source of contamination at the Synertek #1 site is the shallow groundwater plume. Groundwater contaminants are released to the air by volatilization during air stripping and through migration to the surface via soil gas. Both of these air exposure pathways are currently considered unlikely health risks.

The risks from the emission of contaminants from the subsurface are currently difficult to quantify and a formal risk assessment of this pathway for a worst case future residence was not conducted during the RI (see Section 5.2.3). There are currently no residences above or in the immediate vicinity of the plume. It is unlikely that future residences will be built above the plume since this area is not currently zoned for residential development. Deed restrictions on the Synertek #1 property will prevent residential development above the highest VOC concentrations.

Emission dispersion 20 feet from the air stripper tower was calculated to evaluate potential health risk to workers. This distance corresponds approximately with the distance to the parking lot. Maximum observed influent concentrations and liquid flow rates were used as a worst case scenario for air quality. Estimated VOC concentrations were then compared to Threshold Limit Values (TLVs). Under this worst case scenario, the greatest risk from the current treatment system to on-site workers is from 1,1-DCE at 0.04 percent of the TLV.

Risk from air stripper VOC emissions to a hypothetical resident at the nearest property line from the stripper tower (100 feet) was also assessed. An upperbound cancer risk of 4.6×10^{-6} was calculated; an HI value of 0.035 was also obtained. Both of these values are within EPA's acceptable risk range.

6.2.3 Surface Water

San Tomas Aquino Creek is the nearest body of surface water to the Synertek site and is located 7,000 feet downgradient. Groundwater modeling for the A Aquifer Zone predicted that the contaminant plume, if uncontrolled, would discharge into the creek in the year 2049. Maximum levels of contamination at the point of exposure were estimated to be 66% of initial plume concentrations. Potential human exposure at this exposure point could occur through dermal contact with the discharged ground water by an older child or adolescent wading through the creek. A worst case cancer risk of 4.6×10^{-9} and an HI value of 4.9×10^{-7} were calculated for an individual who was exposed for 20 minutes four times a year for 8 years.

6.2.4 Ground Water

Since there is no current use of contaminated ground water, only a future use was considered in the risk analysis. The two exposure pathways from residential use are inhalation exposure to compounds during showering or bathing and drinking water ingestion of 2 liters every day for 30 years. Dermal exposure to chemicals in household water was considered to be minimal in comparison to inhalation and ingestion, and was not evaluated as a significant route of exposure. The average exposure to each chemical contaminant was based on the mean of all values reported and used the detection limit for non-detects. The upper 95th percentile of this mean was determined and was considered the concentration for the evaluation of the reasonably maximally exposed individual.

Table 3 lists the results of risk calculations for the major contaminants of concern (7 indicator chemicals) and compares the total risk from all 33 chemicals evaluated (Table 2) with the sum of the risks from the 7 indicator chemicals. Virtually all of the cancer risk for the worst case (5.0×10^{-3}) is due to the plume indicator chemicals. These chemicals also account for over 75% of the non-cancer risk (HI = 3.3 for all 33 chemicals). Vinyl chloride and 1,1-DCE account for most of the cancer risk, while 1,1-DCE accounts for almost half of the non-cancer risk.

The average case cancer and non-cancer risks were still significant at 1.1×10^{-3} and an HI of 1.3. The contribution of risk from the drinking pathway and the shower/bathing pathway were roughly equal. The risk values in Table 3 represent the sum of these two pathways.

6.3 PRESENCE OF SENSITIVE HUMAN POPULATIONS

Synertek #1 is located in an industrial area and there are no residences lying over the contaminant plume. There are also no public parks, schools, hospitals, or convalescent homes within or near the plume boundaries. The nearest residences are 3,600 feet south of the site and 6,000 feet north-northeast of the site.

6.4 PRESENCE OF SENSITIVE ECOLOGICAL SYSTEMS

Two endangered species are reported to use South San Francisco Bay. The California clapper rail and the salt marsh harvest mouse are reported to exist in the tidal marshes of the bay and bay shore, located approximately 5 miles north of the Synertek site. The endangered California brown pelican is occasionally seen in the Bay Area, but does not nest in the South Bay. Ranges of the endangered American peregrine falcon and southern bald eagle include the Bay Area. The southern bald eagle does not use bay and bayshore habitats, but the peregrine falcon has started to make a comeback at some northern locations in San Franciso Bay.

The Synertek site does not constitute critical habitat for endangered species nor does it include or affect any "wetlands." The closest wetlands are located 13,000 feet north of the site.

Table 3. Maximum Health Risks from Groundwater Contaminants of Concern, Synertek #1

Chemical	Concentration (ppb)		Type of Carcinogen	Risk[1]	
	mean all values	95th Percentile		Cancer	Non-Cancer (Hazard Index)[2]
Vinyl Chloride	19	42	Known Human	2.24×10^{-3}	0
1,1-DCE	32	56	Possible Human	2.06×10^{-3}	1.55
TCE	360	699	Probable Human	4.02×10^{-4}	0
1,1,1-TCA	224	469	Not Classified	0	0.85
1,1-DCA	38	63	Possible Human	2.34×10^{-4}	0.12
Freon 113	58	92	Noncarcinogen	0	0.0008
cis 1,2-DCE	10	17	Noncarcinogen	0	0.00004
			ABOVE INDICATOR CHEMICALS: Subtotal	4.9×10^{-3}	2.5
			ALL EVALUATED CHEMICALS: Total	**5.0×10^{-3}**	**3.3**

(1) Sum of two exposure pathways: inhalation during shower/bathing and ingestion of drinking water

(2) Hazard Index - ratio of the chronic daily intake to the refernce dose (CDI/RfD)
Values > 1.0 indicate a potential health risk

6.5 CONCLUSION

If not addressed by implementing the response action selected in this ROD, the actual or threatened releases of hazardous substances from the Synertek #1 Superfund site may present an imminent and substantial endangerment to the public health, welfare, or environment. Given that a variety of the VOCs detected at the site pose significant health risks as carcinogens or as noncarcinogens and that complete exposure pathways exist, EPA has determined that remediation is warranted.

7.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)

Under Section 121(d)(1) of CERCLA, § 9621, remedial actions must attain a degree of cleanup which assures protection of human health and the environment. Additionally, remedial actions that leave any hazardous substance, pollutant, or contaminant on-site must meet a level or standard of control that at least attains standards, requirements, limitations, or criteria that are "applicable or relevant and appropriate" under the circumstances of the release. These requirements, known as "ARARs", may be waived in certain instances, as stated in Section 121(d)(4) of CERCLA, 42 U.S.C. § 9621(d)(4).

"Applicable" requirements are those cleanup standards, standards of control and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant or contaminant, remedial action, location, or other circumstance at a CERCLA site. "Relevant and appropriate" requirements are cleanup standards, standards of control and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. For example, requirements may be relevant and appropriate if they would be "applicable" but for jurisdictional restrictions associated with the requirement. See the National Contingency Plan, 40 C.F.R. Section 300.6, 1986).

The determination of which requirements are "relevant and appropriate" is somewhat flexible. EPA and the State may look to the type of remedial actions contemplated, the hazardous substances present, the waste characteristics, the physical characteristics of the site, and other appropriate factors. It is possible for only part of a requirement to be considered relevant and appropriate. Additionally, only substantive requirements need be followed. If no ARAR covers a particular situation, or if an ARAR is not sufficient to protect human health or the environment, then non-promulgated standards, criteria, guidance, and advisories must be used to provide a protective remedy.

7.1 TYPES OF ARARS

There are three types of ARARs. The first type includes "contaminant specific" requirements. These ARARs set limits on concentrations of specific hazardous substance, pollutants, and contaminants in the environment. Examples of this type of ARAR are ambient water quality criteria and drinking water standards. The second type of ARAR includes location-specific requirements that set restrictions on certain types of activities based on site characteristics. These include restriction on activities in wetlands, floodplains, and historic sites. The third type of ARAR includes action-specific requirements. These are technology-based restrictions which are triggered by the type of action under consideration. Examples of action-specific ARARs are Resource Conservation and Recovery Act ("RCRA") regulations for waste treatment, storage, and disposal.

ARARs must be identified on a site-specific basis from information about specific chemicals at the site, specific features of the site location, and actions that are being considered as remedies.

7.2 CONTAMINANT-SPECIFIC ARARS AND TBCS

<u>Section 1412 of the Safe Drinking Water Act, 42 U.S.C. Section 300g-1</u>

Under the authority of Section 1412 of the Safe Drinking Water Act, Maximum Contaminant Levels Goals (MCLGs) that are set at levels above zero, shall be attained by remedial actions for ground or surface water that are current or potential sources of drinking water, where the MCLGs are relevant and appropriate under the circumstances of the release based on the factors in §300.400 (g)(2).

The appropriate remedial goal for each indicator chemical (except toluene and 1,2,4-TCB) in ground water is the MCLG (if not equal to zero), the federal MCL, or the State MCL, whichever is most stringent.

California Department of Health Services Drinking Water Action Levels (DWALs)

California Department of Health Services (DHS) DWALs are health-based concentration limits set by the DHS to limit public exposure to substances not yet regulated by promulgated standards. They are advisory standards that apply at the tap for public water supplies. The DWAL for toluene is 100 ppb. These DWALs are not ARARs, but are "To Be Considereds" or TBCs. ARARs with more stringent requirements take precedence over these DWALs.

California's Resolution 68-16

California's "Statement of Policy With Respect to Maintaining High Quality of Waters in California," Resolution 68-16, affects remedial standards. The policy requires maintenance of existing water quality unless it is demonstrated that a change will benefit the people of the State, will not unreasonably affect present or potential uses, and will not result in water quality less than that prescribed by other State policies.

7.3 ACTION SPECIFIC ARARS AND TBCS

National Pollutant Discharge Elimination System (NPDES)

NPDES substantive permit requirements and/or RWQCB Waste Discharge Requirements (WDRs) are potential ARARs for effluent discharges. The effluent limitations and monitoring requirements of an NPDES permit or WDRs legally apply to point source discharges such as those from a treatment system with an outfall to surface water or storm drains. The RWQCB established effluent discharge limitations and permit requirements based on Water Quality Standards set forth in the San Francisco Bay Regional Basin Plan.

EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.0-28

OSWER Directive 9355.0-28 "Control of Air Emissions from Superfund Groundwater Air Strippers at Superfund Groundwater Sites" applies to future remedial decisions at Superfund sites in ozone non-attainment areas. Future remedial decisions include Records of Decisions (RODs), Significant Differences to a ROD and Consent Decrees. Synertek Building #1 is in an ozone non-attainment area. This directive requires such sites to control total volatile organic compound emissions from air strippers and soil vapor extractors to fifteen pounds per day per facility. This directive is not an ARAR, but is a TBC. ARARs with more stringent requirements take precedence over the directive.

Bay Area Air Quality Management District (BAAQMD) Regulation 8, Rule 47

Bay Area Air Quality Management District Board of Directors adopted Regulation 8, Rule 47. This rule is entitled "Air Stripping and Soil Vapor Extraction Operations" and applies to new and modified operations. The rule consists of two standards:

- o Individual air stripping and soil vapor extraction operations emitting benzene, vinyl chloride, perchloroethylene, methylene chloride and/or trichloroethylene are required to control emissions by at least ninety percent by weight. Operations emitting less than one pound per day of these compounds are exempt from this requirement if they pass a District risk screen.

- o Individual air stripping and soil vapor extraction operations emitting greater than fifteen pounds per day of organic compounds other than those listed above are required to control emissions by at least ninety percent by weight.

Regulation 8, Rule 47 is an ARAR for the implementation of the remedy at Synertek #1.

Safe Drinking Water Act, Underground Injection Control (UIC)

If treated ground water is injected, it must be done in compliance with regulations for a Class V underground injection well. These regulations are found in the 40 CFR 144, especially 144.13 (4) (c).

Resource Conservation Recovery Act (RCRA) Land Disposal Restrictions

The contaminated ground water contains two spent solvents that are RCRA listed wastes. TCE is an F001 listed waste, and TCA is an F002 listed waste. Adsorbents and other materials used for remediation of groundwater VOCs, such as activated carbon, chemical-adsorbing resins, or other materials used in the treatment of ground water or air will contain the chemicals after use. RCRA land disposal restrictions are not applicable but are relevant and appropriate to disposal of treatment media due to the presence of constituents which are sufficiently similar to RCRA wastes.

7.4 LOCATION-SPECIFIC ARARS

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act is an applicable requirement for the locations adjacent to San Tomas Aquino Creek and other tributary streams and marshes.

8.0 DESCRIPTION OF ALTERNATIVES

8.1 REMEDIAL ACTION OBJECTIVES

Cleanup of groundwater contamination at the Synertek #1 Superfund site focuses on the following remedial action objectives:

1. Prevention of the near-term and future exposure of human receptors to contaminated ground water;

2. Restoration of the contaminated ground water for future use as potential drinking water;

3. Control of contaminant migration;

4. Monitoring of contaminant concentrations in the ground water.

8.2 GROUNDWATER CLEANUP STANDARDS

The cleanup standards for contaminated ground water at the Synertek #1 Superfund site are based on chemical specific ARARs for 14 of the 33 contaminants of concern. Table 4 lists the cleanup standards and the corresponding health risks of leaving these 14 targeted chemicals in the ground water at their particular cleanup standard. Cleanup to these levels will result in a final cancer risk of 2.7×10^{-5} and a non-cancer risk of an HI equal to 0.72. This represents a 95% reduction in cancer risk and a 78% reduction in non-cancer risks. Cleanup standards were assigned to only 14 of the 33 chemicals of concern because there are currently no cleanup criteria established for the other 19 chemicals. In addition, the concentrations of the other 19 chemicals, which were all detected infrequently at relatively low concentrations, will be reduced in the process of achieving the cleanup standards for the 14 targeted chemicals.

Cleanup standards for extracted ground water that will be discharged to San Tomas Aquino creek are listed in the current NPDES permit for Synertek's interim remedial measure. These standards (Table 5) apply at the point of discharge and are protective of human health and the surface water environment.

The compliance boundary includes all ground water within the plume boundaries indicated in Figures 6 and 7, all ground water monitored in existing wells used in the quarterly monitoring program, and any contaminated groundwater defined by additional monitoring wells installed upon RWQCB or EPA request for the purpose of monitoring potential vertical or horizontal migration of the plumes currently located in the A and B Aquifer Zones.

Table 4. Groundwater Cleanup Standards, Synertek #1

Cleanup standards for all onsite and offsite wells shall not be greater than the levels as provide in this table. The numerical final cleanup standards, therefore, shall not exceed the below listed levels in any well used for monitoring the plume in any aquifer zone.

Chemical	Cleanup Standard (ppb)	Reference	EPA MCL Goal (ppb)	Risks at Cleanup Stds: Cancer	Risks at Cleanup Stds: non-Cancer
acetone	350	RISK	NA	7.1×10^{-7}	0.10
benzene	1	CA MCL	0	6.9×10^{-7}	0.04
bis(2-ethylhexyl)phthalate	4	CA MCL	NA	5.6×10^{-6}	0.006
1,1-dichloroethane	5	CA MCL	NA		0.002
1,1-dichloroethene	6	CA MCL	7		0.02
cis-1,2,-dichloroethene	6	CA MCL	70 (proposed)		0
ethylbenzene	680	CA MCL	700 (proposed)		0.37
Freon-113	1200	CA MCL	NA		0.001
styrene	5	EPA MCL PR	0 (proposed)	2×10^{-6}	0.0007
toluene	100	CA AL	2000 (proposed)		0.01
1,1,1-trichloroethane	200	CA MCL	200		0.08
trichloroethene	5	CA MCL	0	1.7×10^{-6}	0.02
vinyl chloride	0.5	CA MCL	0	1.6×10^{-5}	0
xylenes	175	RISK	10,000		0.06
			TOTAL	**2.7×10^{-5}**	**0.72**

CA MCL - California State Maximum Contaminant Level (MCL) for Drinking Water (adopted).
EPA MCL PR - Proposed EPA Maximum Contaminant Level (MCL) for Drinking Water
CA AL - California DHS Action Level
NA - Not Available
RISK - Cleanup standard for acetone set an order of magnitude lower than the level that would contribute a value of 1.0 to the cumulative non-carcinogenic risk (total Hazard Index)
- Cleanup standard for xylenes set an order of magnitude below CA MCL of 1750 ug/l to reduce its contribution to the cumulative non-carcinogenic risk from 0.6 to 0.06

Table 5. Extracted - Groundwater Cleanup Standards for Discharge

Contaminant	NPDES Discharge Limit (ppb)
1,1 DCE	5
trans 1 2-DCE	5
VC	5
Freon 113	5
1,1,1-TCA	5
TCE	5
1,1-DCA	5

8.3 REMEDIAL ACTION ALTERNATIVES

Alternatives addressing the groundwater contamination and remedial action objectives were developed from a list of technologies that survived an initial screening of technologies and response actions. This list includes groundwater monitoring, restrictions on deeds and well permits, groundwater extraction wells, air stripping, carbon adsorption, injection of treated water, and discharge of treated water to surface water.

Alternative 1 - No Action

The no action alternative assumes that the interim remedial action operated since 1985 is an adequate response. The groundwater extraction and treatment system currently in operation would be shut down. Contaminant concentrations would be reduced by natural attenuation as the plume continued to migrate towards San Francisco Bay. Groundwater monitoring would not be continued.

No action alternatives at Superfund groundwater sites typically include groundwater monitoring to help establish a baseline for comparison of costs. This is not the case for Synertek #1 because the closely-related Alternative 2 includes groundwater monitoring as its only cost.

Alternative 2 - Institution Controls and Groundwater Monitoring

Alternative 2 consists of implementing long-term groundwater monitoring and institutional controls. These controls would consist of deed restrictions and well permit restrictions prohibiting the use of the A and B Aquifers for drinking water supply. As in the No Action alternative, the groundwater extraction and treatment system would be shut down, allowing the further migration of contaminants. Natural attenuation would reduce contaminant concentrations in the ground water. Continued groundwater monitoring would delineate the advancing plume boundaries, and the fate and transport behavior of the chemical contaminants.

Alternative 3 - Maintain Existing Groundwater Extraction System with Existing Air Stripping

Alternative 3 consists of maintaining the existing groundwater extraction and treatment system which uses on-site and off-site extraction wells and air stripping treatment prior to discharge to San Tomas Aquino Creek under an NPDES permit. Air emissions would continue to be regulated under a BAAQMD permit that currently does not require emissions control.

Deed restrictions and well permit restrictions would be implemented to prevent the use of ground water in the A and B Aquifers while remediation is in effect. Well cleaning and a pilot injection study would be conducted to potentially enhance the removal of contaminants, speed the cleanup, and reduce the amount of ground water discharged to the surface. Attempts would be made to locate and seal abandoned wells located within the plume boundaries.

Alternative 4 - Existing Groundwater Extraction System with Carbon Adsorption

Alternative 4 utilizes the existing on-site and off-site groundwater extraction systems with liquid-phase carbon adsorption treatment prior to discharge into San Tomas Aquino Creek under an NPDES permit. The existing air stripping system would not be used.

As in Alternative 3, deed restrictions and well permit restrictions would be implemented to prevent the use of ground water in the A and B Aquifers while remediation is in effect. Well cleaning and a pilot injection study would be conducted to potentially enhance the removal of contaminants, speed the cleanup, and reduce the amount of ground water discharge to the surface. Attempts would be made to locate and seal abandoned wells located within the plume boundaries.

9.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

This section provides an explanation of the criteria used to select the remedy, and an analysis of the remedial action alternatives in light of those criteria, highlighting the advantages and disadvantages of each alternative.

9.1 CRITERIA

The alternatives were evaluated using nine component criteria. These criteria, which are listed below, are derived from requirements contained in the National Contingency Plan (NCP) and CERCLA Sections 121(b) and 121(c).

1. Overall protection of human health and the environment.

2. Short term effectiveness in protecting human health and the environment.

3. Long-term effectiveness and permanence in protecting human health and the environment.

4. Compliance with ARARs (ARARs are detailed in Section 7.0).

5. Use of treatment to achieve a reduction in the toxicity, mobility, or volume of the contaminants.

6. Implementability.

7. State acceptance/support agency acceptance.

8. Community acceptance.

9. Cost.

9.2 ANALYSIS OF ALTERNATIVES

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

Alternatives 3 and 4 basically provide equal protection of human health and the environment because they both extract ground water that contains contaminants at concentrations above drinking water standards. Extraction prevents further migration of the plume. Deed restrictions protect against use of the aquifers before cleanup is completed. After cleanup, both Alternatives 3 and 4 are estimated to result in a reduced cancer risk of 2.7×10^{-5} and a reduced HI of 0.72. Water discharged or reinjected following treatment would meet NPDES requirements which are protective of human health and the environment.

Alternative 4 could be considered slightly more protective than Alternative 3 since it would not involve the transfer of groundwater contaminants to the air and might involve the destruction of the contaminants by regeneration of the granular activated carbon. Air emissions from Alternative 3 are considered sufficiently protective, however, since they meet BAAQMD permit requirements, while the calculated worst case cancer risk is 4.6×10^{-6} and the HI is less than 1.

Alternative 2 is less protective than Alternatives 3 and 4 because it would allow the contaminated ground water to continue migrating. Deed restrictions and well permit restrictions would need to be imposed for a significantly greater amount of time than those of Alternatives 3 and 4, since natural attenuation of groundwater contaminant concentrations could require more than 100 years compared to the approximately 25 year cleanup time for Alternatives 3 and 4.

Both Alternatives 1 and 2 provide no reduction in risk. While future use of the contaminated ground water may be unlikely, a future user of the contaminated ground water would be exposed to a cancer risk of 5.0 X 10^{-3} and an HI of 3.3. Alternative 1 is least protective of human health and the environment. Because it does not include deed restrictions or groundwater monitoring, Alternative 1 greatly increases the chances that an individual will install a well into a migrating plume.

COMPLIANCE WITH ARARS

Both Alternatives 3 and 4 would attain all pertinent ARARS identified in Section 7. The Safe Drinking Water Act MCLs and California Department of Health Services DWALs would be achieved by extracting ground water contaminated above these levels. NPDES permit requirements would be met by proper design and operation of either treatment system. The Fish and Wildlife Coordination Act would not be an ARAR for Alternatives 3 and 4 because the groundwater extraction system would prevent the plume from reaching surface waters or wet lands and the treatment system would ensure that discharged water was protective of human health and the environment. In the event that the treated ground water is injected, the UIC regulation would apply and be attained.

The RCRA land disposal restrictions would apply to the spent carbon from Alternative 4 and would also apply to Alternative 3 in the event that it became necessary to implement air stripper emissions control involving gas-phase activated carbon. The spent carbon could be treated before reuse or disposal by an incineration process.

Only Alternative 3 would need to comply with OSWER Directive 9355.0-28 and BAAQMD Regulation 8, Rule 47 because of the air stripper emissions. These ARARs are addressed by the BAAQMD permitting process. If permit modifications become necessary, emissions could be captured and destroyed by available technology.

The drinking water ARARS would not be attained by either Alternatives 1 or 2, since contamination would be left in place. The Fish and Wildlife Coordination Act would become an ARAR if the plume migrated to San Tomas Aquino Creek and other tributary streams and marshes. California's resolution 68-16 would not be achieved since the groundwater contaminants would unreasonably affect the present and potential uses of the upper aquifers. RCRA land disposal restrictions, NPDES requirements, BAAQMD Regulation 8, and OSWER Directive 9355.0-28 would not apply to Alternatives 1 or 2 since neither one uses treatment.

REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

Both Alternatives 3 and 4 reduce the toxicity, mobility, and volume of groundwater contaminants by removing greater than 99% of the contaminants from the extracted ground water. Alternative 4 concentrates the contaminants onto granular activated carbon, which would then be regenerated or properly disposed at a landfill. Contaminants could potentially be destroyed during carbon regeneration, making any future release of the removed contaminants impossible.

Alternative 3 transfers the groundwater contaminants to the air where their toxicity, mobility, and volume as air contaminants actually increases. In addition, some of the VOCs are ozone precursors. The current air stripper is operating under a BAAQMD permit that does not require emissions control.

Neither Alternative 1 or 2 reduces toxicity, mobility, or volume.

LONG-TERM EFFECTIVENESS AND PERMANENCE

Alternatives 3 and 4 include groundwater extraction which is intended to reduce the level of contamination in the A and B Aquifer Zones to the cleanup standards indicated in Section 8.2. Thus, potential risks to the community currently posed by the site in its present condition are minimized. To ensure that the magnitude of residual risks are minimized, the performance of the groundwater extraction system will be carefully monitored on a regular basis and adjusted as warranted by the performance data collected during operation.

The potential future risk from long-term exposure to volatilized contaminants that are emitted from the soil and accumulate inside residences is addressed by the groundwater extraction system in Alternatives 3 and 4. Groundwater extraction reduces the amounts of contaminants that could volatilize into the soil gas and eventually into surface air. Furthermore, deed restrictions will prevent the building of residences above the on-site portion of the plume until it is cleaned up. Due to current zoning, there are no residences above or in close proximity to the overall plume. Finally, this newly recognized potential problem will be much better understood by the time the first five-year review occurs. If necessary, more refined air sampling could be conducted at that time, and fans or other ventilation aids could be provided to any affected buildings.

Treatment by air stripping provided by Alternative 3 is reliable for the long-term removal of VOCs from the ground water. Treatment residuals are expected to be negligible based on the high volatility of the compounds present in the ground water.

Treatment by aqueous phase granular activated carbon provided by Alternative 4 is reliable for the removal of VOCs from the ground water. Treatment residuals are expected to be negligible since they will be concentrated on a relatively small amount of carbon that will either be properly disposed in a landfill or regenerated by a destructive technology.

Alternatives 1 and 2 provide no long-term effectiveness.

SHORT-TERM EFFECTIVENESS

The short-term impact to the health of workers and the community will be very minimal for Alternatives 3 and 4 because the groundwater extraction system is already in place as the interim remedial action at the site. There would be no current additional risks since the plume is already contained and the treatments are protective. Groundwater cleanup time is estimated to require about 25 years. Uncontrolled air emissions from Alternative 3 make it slightly less effective in protecting health and the environment than Alternative 4 in the short-term.

Alternatives 1 and 2 do not include the implementation of treatment remedies; therefore, there are no additional risks to the community. Risks associated with the contaminant plume would remain at the site for over 100 years until natural attenuation reduces the contaminant concentrations down to the cleanup standards. Alternative 2 reduces future risk of groundwater ingestion if shallow groundwater is considered for use as a drinking water source.

IMPLEMENTABILITY

Alternatives 3 and 4 include the same extraction system which is already in place. Both alternatives provide groundwater treatment with either an air stripper or carbon adsorption. Both methods are proven technologies and there are no technical considerations that prohibit the use of either of these technologies. In addition, both alternatives are administratively feasible using existing permits for discharge or air emissions. Approval of possible injection of treated water is considered likely.

There are no technical concerns regarding the implementability of Alternatives 1 and 2. Institutional controls required in Alternatives 2, 3, and 4 are administratively feasible.

COST

Alternatives 3 and 4 have roughly similar costs. The present worth cost of Alternative 4 is $1,053,000 compared to $895,000 for Alternative 3. Annual operation and maintenance (O&M) costs are $68,400 and $61,000 respectively. The $89,000 capital costs for Alternative 4 are significantly greater than the $36,000 capital costs for Alternative 3. Present worth costs were based on a 25-year operation period and a 5% discount rate.

The $217,000 present worth cost for Alternative 2 is based on a 30-year time period using a 5% discount rate. The capital costs and annual O&M costs for Alternative 2 are $5,000 and $13,800 respectively.

Of the $217,000 present worth cost for Alternative 2, $212,000 is due to groundwater monitoring. Normally, groundwater monitoring costs would apply to the no action alternative and would be used for a baseline comparison with the other alternatives. For the Synertek #1 site, Alternative 1 was used as the no action alternative and does not involve any actions, including groundwater monitoring. Thus Alternative 1 has no cost.

SUPPORT AGENCY ACCEPTANCE

The Feasibility Study and the Proposed Plan Fact Sheet were reviewed by the RWQCB and they concur with EPA's preferred alternative.

COMMUNITY ACCEPTANCE

The Proposed Plan was presented to the community of Santa Clara in a fact sheet and at a public meeting. No technical comments were submitted regarding the alternatives. Other comments received are addressed in the Responsiveness Summary.

9.3 THE SELECTED REMEDY

9.3.1 Basis of Selection

Maintaining the existing groundwater extraction system with the existing air stripper (Alternative 3) is the selected remedy for the Synertek #1 Superfund site. This remedy addresses only the contaminated ground water since all contaminated soils and structures were removed during the interim remedial action.

Alternatives 3 and 4 were the only alternatives that met all of the nine criteria and adequately addressed the remedial action objectives. The only difference between the two alternatives is the type of treatment. Air stripping and carbon adsorption are equally effective at treating the groundwater contaminants, and only differ in the area of treatment residuals. Under a current BAAQMD permit, residual contaminants from the air stripper are released directly to the air. Risk from these contaminants (4.6×10^{-6}) is within the acceptable EPA risk range. Residual contaminants adsorbed to the liquid-phase granular activated carbon would be destroyed during regeneration or confined to a small concentrated volume in a proper landfill.

Despite slight advantages of carbon adsorption in dealing with treatment residuals resulting in better reduction of toxicity, mobility, and volume, the existing air stripper provides several advantages. These advantages include the fact that the air stripper costs less than carbon adsorption and is already installed and operating in accordance with current permits. In addition, residuals from the air stripper could potentially be captured and destroyed by available emissions control technology if permit modifications become necessary. Therefore, Alternative 3 was selected as the groundwater remedy for Synertek #1.

9.3.2 Features of the Remedy

Alternative 3 maintains the existing groundwater extraction system with the existing air stripper for a present worth cost of 0.9 million dollars. It is already implemented and operating with acceptance from the community and federal, state, and local agencies. Alternative 3 consists of the following features:

* **Groundwater extraction** from two on-site and two off-site wells in the A Aquifer and one on-site well in the B Aquifer sends a combined flow of approximately 15 gpm to the air stripper. The well locations and pumping rate contain the plume and prevent further migration of the VOC-contaminated ground water. The cancer risk of 5 X 10^{-3} for a future use of drinking water contaminated with vinyl chloride, 1,1-DCE, and TCE will be continually reduced over an estimated 25-year period to a risk of 2.7 X 10^{-5}. Thus, groundwater extraction until drinking water standards are achieved will attain ARARs and permanently restore the contaminated aquifers to their maximum beneficial uses.

* **Air stripping** will remove more than 99% of the VOCs from the extracted ground water allowing the treated effluent to be discharged under an existing NPDES permit to San Tomas Aquino Creek without degrading this surface water or presenting a significant risk to human health and the environment. The stripped VOCs are emitted directly to the air under an existing BAAQMD permit and they exert a theoretical cancer risk of 4.6 X 10^{-6}. The air stripper will include air emissions control if emissions exceed levels permitted by the BAAQMD.

* **Periodic groundwater monitoring** will verify plume containment, determine current plume boundaries, and follow the decrease in VOC concentrations as the cleanup progresses.

* **A pilot injection study** will evaluate whether injection of the treated water back to the subsurface would enhance the removal of pollutants, speed the cleanup, and reduce the amount of ground water discharged to the surface.

* **Institutional controls** consisting of deed and well-permit restrictions will protect humans from exposure to the contaminated ground water during the estimated 25-year cleanup period.

* **Potential conduit investigations** will attempt to locate and seal the remaining abandoned agricultural well that is believed to exist very close to the plume. This will help prevent vertical migration of the plume and contamination of deeper aquifers currently used for drinking water.

9.3.3 Uncertainty in the Remedy

The goal of this remedial action is to restore the ground water to its beneficial use, which is, at this site, a potential source of drinking water. Based on information obtained during the RI and on a careful analysis of all remedial alternatives, EPA and the RWQCB believe that the selected remedy will achieve this goal. It may become apparent, during implementation or operation of the groundwater extraction system and its modifications, that contaminant levels have ceased to decline and are remaining constant at levels higher than the cleanup standards over some portion of the plume. In such a case, the system performance standards and/or the remedy may be reevaluated by EPA.

The selected remedy will include groundwater extraction for an estimated period of 25 years, during which the system's performance will be carefully monitored on a regular basis and adjusted as warranted by the performance data collected during operation. Modifications may include any or all of the following:

a) at individual wells where cleanup goals have been attained, pumping may be discontinued;

b) alternating pumping at wells to eliminate stagnation points;

c) pulse pumping to allow aquifer equilibration and to allow adsorbed contaminants to partition into ground water; and

d) installation of additional extraction wells to facilitate or accelerate cleanup of the contaminant plume.

To ensure that cleanup goals continue to be maintained, the aquifer will be monitored at those wells where pumping has ceased on an occurrence of every 5 years following discontinuation of groundwater extraction.

10.0 STATUTORY DETERMINATIONS

The selected remedy will comply with Section 121 of CERCLA. The selected remedy protects human health and the environment through extraction and treatment of the VOC-contaminated ground water. This remedy addresses only the contaminated ground water since all contaminated soils and structures were removed during the interim remedial action. The reductions in risk are summarized for groundwater extraction and air stripping in Section 9.3.2 of this ROD. There are no short-term or long-term threats associated with the selected remedy that cannot be readily controlled. In addition, no adverse cross-media affects are expected from the remedy.

The selected remedy will comply with all of the identified chemical, action, and location specific ARARs that are described in Section 7 of this ROD. In the event that it becomes apparent that the drinking water ARARs may not be achievable as described in Section 9.3.3 of this ROD, the system performance standards and/or the remedy may be reevaluated.

The present worth cost of the selected remedy is $895,000. It is the least costly of the two alternatives which are equally protective of human health and the environment. The selected remedy is already installed and operating in accordance with current permits for water discharge and air emissions.

The selected remedy uses permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element. Section 9.3.2 of this ROD summarizes the key features of the selected remedy. If successful, injection of treated groundwater will constitute a recovery of a valuable resource. In addition, the remaining toxicity, mobility, and volume of contaminants emitted from the air stripper could be potentially captured and destroyed by available emissions control technology if permit modifications become necessary.

Because the remedy will result in hazardous substances remaining on-site above health-based levels, a five-year review, pursuant to CERCLA Section 121, 42 U.S.C. Section 9621, will be conducted at least once every five years after initiation of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

PART III. RESPONSIVENESS SUMMARY

1.0 INTRODUCTION

This section of the Record of Decision contains agency responses to all significant verbal and written comments submitted to RWQCB or EPA staff during the 30-day public comment period and at the Community Meeting held January 17, 1991. This ROD does not contain any significant changes to the remedy that was made available for public comment and described in the Proposed Plan Fact Sheet and the RWQCB orders.

The public comment period began with a public meeting of the executive board of the RWQCB on January 16, 1991 and ended 30 days later on February 15, 1991. Additional time for public comment was available up until and during the second public meeting of the executive board of RWQCB held on March 20, 1991. EPA staff did not receive any comments during these time periods.

2.0 REGIONAL WATER QUALITY CONTROL BOARD RESPONSES

Since RWQCB is the lead agency for Synertek #1 and received all of the comments, RWQCB prepared the Responsiveness Summary (Attachment A). EPA, as the support agency, has reviewed and concurs with the RWQCB responses.

ATTACHMENT A

RWQCB RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

Former Synertek #1 Facility
3050 Coronado Drive
Santa Clara

1.0 Introduction

This Responsiveness Summary is a compilation of comments received and responses made by Regional Board staff regarding the proposed Remedial Action Plan (RAP) for the Former Synertek #1 Facility.

Written comments (attached) have been received from Shih-In and David Shirley, the Santa Clara Valley Water District (SCVWD), the California Department of Health Services' Office of Drinking Water (ODW), the Environmental Protection Agency (EPA), Honeywell Inc., and the RREEF Funds regarding the Revised Tentative Order.

Shih-In and David Shirley and the SCVWD both commented in support of the proposed RAP. Thus no further response to their comments is necessary.

2.0 ODW Comments

ODW commented that they did not support the use of drinking water standards as the target cleanup standards for contaminated groundwaters, especially at sites involving multiple chemicals. ODW recommends the use of the 10^{-6} carcinogenic risk levels as cleanup levels whenever this level of protection is feasible, instead of EPA's 10^{-4} to 10^{-6} Carcinogenic Risk Range as acceptable health risk levels for carcinogens in the drinking water. At a minimum, the proposed remediation alternatives should evaluate the cleanup levels necessary to achieve an aggregate carcinogenic risk of 10^{-6} as well as estimates of cost and time needed to reach this acceptable health risk level for drinking water.

2.1 Response to ODW Comments

The aggregate carcinogenic risk associated with the cleanup standards in the proposed RAP is 2.7×10^{-5}. Honeywell estimated that it will take 25 years and cost approximately $895,000 to reach these cleanup standards.

ODW recommends that the Board evaluate the cleanup levels, cost and time necessary to achieve an aggregate carcinogenic risk of 10^{-6}. Honeywell estimated that the cleanup standard for TCE would need to be set at 1 ppb to reach an aggregate carcinogenic risk of 10^{-6}. Honeywell also estimated that it would take approximately 50 years and cost approximately $1,149,000 to reach a cleanup standard of 1 ppb TCE.

However, it should be noted that at the point in the cleanup when the remedial action has reduced TCE to the cleanup standard of 5.0 ppb, the remedial action should have reduced the other chemicals far below detection limits. Note that TCE, the pollutant detected at the highest concentration onsite, is currently detected at a maximum concentration of 3400 ppb, compared to Freon-113, the pollutant detected at the second highest concentration onsite, at 810 ppb (based on December 1990 sampling). At this point when the remedial action reduces TCE to the cleanup standard of 5.0 ppb, the residual risk will approximate the estimated risk related to the concentration of TCE alone, or 1.7×10^{-6}. Thus the residual risk is likely to be 10^{-6} when cleanup is completed as ODW requested.

3.0 EPA Comments

EPA commented on the language used in the Order regarding future changes to cleanup standards - particularly if those standards were found in the future to be infeasible (see attached letter dated February 26, 1991).

3.1 Response to EPA Comments

Based on EPA's comments the following changes have been made:

Finding 22.a. Replace the word "feasible" with the phrase "technically practicable from an engineering perspective". Replace the word "infeasible" with the phrase "technically impracticable from an engineering perspective".

Finding 23. Replace the word "infeasible" with the phrase "technically impracticable from an engineering perspective".

Finding 26. Add the following sentence to the end of the first paragraph: "However, any change to the cleanup standards or remedy will require Board and EPA approval".

Finding 27. Delete the following words from the first sentence: "cannot reasonably be attained or".

4.0 Local Community Issues

This section of the Responsiveness Summary is generally a summary of major issues and concerns raised by the local community. However, no major issues or concerns were raised by the local community. Therefore this section summarizes the public meeting which took place on January 17, 1991 to present and receive comments on the proposed RAP held in the City of Santa Clara.

Despite an aggressive community relations program, which included publishing two quarter-page newspaper advertisements and mailing over four hundred notices to local residents, only two members of the public attended the meeting. The transcript of the public meeting is included as an attachment to this Responsiveness Summary.

During the public meeting questions were asked by the two members of the public on the following general topics: 1) background on the Superfund process, 2) background on the groundwater reinjection test, 3) whether the pollutant plume is commingled with plumes from any other pollution sites, and 4) what type of enforcement activities have been directed at Honeywell.

No member of the public has requested modification of the proposed RAP for the site. Therefore, no changes were made to the RAP as a result of public comment.

5.0 Discharger Comments

This section addresses the specific written comments submitted by Honeywell and the RREEF Funds.

5.1 Honeywell Comments

Provision 2.a.2) requires that implementation of a full scale groundwater injection system be completed within 90 days from approval of a proposal submitted in the report regarding the injection test results. We believe that 120 days would be more appropriate to assure that the following subtasks are completed in an appropriate fashion:

- finalize design of full scale injection system
- solicit, receive and evaluate bids from contractors
- obtain necessary permits or access agreements
- construct system
- start-up

5.2 Response to Honeywell Comments

The completion date for Provision 2.a.2) has been changed from 90 to 120 days.

5.3 RREEF Funds Comments

The RREEF Funds requested clarification of the intended meaning of Provision C.12. However, the RREEF Funds does not object to the provision as drafted, and the RREEF Funds will comply with the provision.

5.4 Response to RREEF Funds Comments

Board staff explained to the RREEF Funds that Provision C.12 requires the RREEF Funds to file a letter report informing the Regional Board that a change in site occupancy or ownership had occurred and provide the name of the new occupant or owner and the person(s) who would act as a contact person for that occupant or owner.

6.0 Responsiveness Summary Conclusion and Changes to the Proposed RAP

All verbal and written comments regarding changes to the proposed RAP have been addressed. Board staff are not aware of any outstanding comments on the proposed RAP. Based on this Responsiveness Summary, staff has not significantly changed the Tentative Order.

Attachments:

Shih-In and David Shirley comments dated January 12, 1991
SCVWD comments dated February 5, 1991
ODW comments dated January 28, 1991
EPA comments dated February 26, 1991
Honeywell comments dated February 12, 1991
Graham & James (The RREEF Funds) comments dated January 14, 1991

January 17, 1991 Community Meeting Transcripts (available upon request)

1/12/91

Dear Mr. Bartow,

Thank you for the information on the Synertek clean-up.

Given the information in the newsletter, Alternatives 3 or 4 seem to be acceptable.

Alternatives 1 & 2 are unacceptable from a Santa Clara resident's point of view. The excess cancer cases of 1 in 10,000 could be one of us.

Sincerely

Shih-In Shirley

David Shirley

Shih-In & David Shirley
2517 Royalridge Way
Santa Clara, CA 95051-1243

Santa Clara Valley Water District
5750 ALMADEN EXPRESSWAY
SAN JOSE, CALIFORNIA 95118
TELEPHONE (408) 265-2600
FACSIMILE (408) 266-0271
AN AFFIRMATIVE ACTION EMPLOYER

CALIFORNIA REGIONAL WATER
FEB 0 1991
QUALITY CONTROL BOARD

February 5, 1991

Mr. Gregory Bartow
Regional Water Quality Control Board
1800 Harrison Street, Suite 700
Oakland, CA 94612

Dear Mr. Bartow:

Subject: Comments on Synertek Building No. 1, Final RAP

We are in general concurrence with your final clean-up plan for the Synertek Building No. 1 site located at 3050 Coronado Drive, Santa Clara.

We also concur with the requirement of a pilot study to assess the feasibility of a controlled program of reinjection of treated waters into the affected shallow aquifers. If successful, we would expect it to lead to a more expeditious cleanup and a conservation of groundwater.

Please call Tom Iwamura or myself should you have any questions.

Sincerely,

David J. Chesterman
Supervising Engineer
Groundwater Protection Division

State of California

Department of Health Services

Memorandum

5/n

To : Steven Ritchie, Executive Officer
Regional Water Quality Control Board
1800 Harrison St., Suite 700
Oakland, CA 94612

Date : January 28, 1991

Subject: Tentative Orders
Site Clean-up
Requirements-
Synertek Building
No. 1, Superfund
Site-Santa Clara Cy

From : Office of Drinking Water
2151 Berkeley Way, Rm 458
Berkeley, CA 94704
8-571-2160

The subject document has been reviewed by the Department of Health Services, Office of Drinking Water (ODW). We offer the following comments:

> We concur with the staff's recommendation of maintaining the interim remedial measures in addition to implementing deed and well permitting restrictions, as well as pilot injection studies as the final groundwater cleanup plan for the Synertek Building #1 Superfund site in the City of Santa Clara. We also agree with Provision C.2 of the Tentative Order requiring Honeywell to further search and indentify wells that potentially may form migration pathways to the regional aquifer.
>
> The Department does not support the use of drinking water standards as the target cleanup levels for contaminated groundwaters, especially at sites involving multiple chemicals. ODW recommends the use of the 10^{-6} carcinogenic risk level as cleanup levels whenever this level of protection is feasible, instead of EPA's 10^{-4} to 10^{-6} Carcinogenic Risk Range (CCR) as acceptable health risk levels for carcinogens in drinking water.
>
> At a minimum, the proposed remediation alternatives should evaluate the cleanup levels necessary to achieve an aggregate carcinogenic risk of 10^{-6} as well as estimates of cost and time needed to reach this acceptable health risk level for drinking water.

We appreciate the opportunity to provide technical review and evaluation to water supply issues of the Synertek Building #1

Superfund Cleanup Program. For further question on this matter, please contact Gregory Eager at (415) 540-3188.

Catherine S. Ling, P.E.
District Engineer
Monterey District

cc: City of Santa Clara

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

February 26, 1991

Greg Bartow
Regional Water Quality Control Board
1800 Harrison St., Suite 700
Oakland, CA 94612

Dear Greg:

Enclosed are comments on the Revised Tentative Order for Honeywell's former Synertek #1 facility. These comments clarify EPA's position from an enforcement point of view. If you have any questions, please do not hesitate to call.

Sincerely,

Joseph B. Healy, Jr.
Remedial Project Manager

JBH/jbh

Encl: Comments on Synertek Tentative Order

cc: Jim Hanson (EPA)
Ron Gervason (RWQCB)

EPA REGION IX COMMENTS ON REVISED TENTATIVE ORDER FOR HONEYWELL'S FORMER SYNERTEK #1 FACILITY

1. Sections 22 and 23 of the Tentative Order provide that the groundwater cleanup standards will be achieved in all Synertek monitoring wells unless the Board determines that meeting these standards is "infeasible", in which case groundwater extraction shall continue as long as significant quantities of chemicals are being removed through groundwater extraction. As drafted, these provisions arguably violate section 121 of CERCLA. Under CERCLA section 121, the remedial alternative selected must attain ARARs unless EPA finds that a waiver is warranted under 121(d)(4). CERCLA section 121(d)(4) does not provide for a waiver based on a finding that attaining ARARs is "infeasible". Section 121(d)(4) allows for a waiver only where compliance with ARARs is "technically impracticable from an engineering perspective". Therefore, these sections of the Order should be changed to reflect that the Board will only allow a waiver of ARARs where compliance would be "technically impracticable from an engineering perspective". In addition, section 22 of the Order should acknowledge that EPA must approve any waiver of ARARs.

2. Section 26 of the Tentative Order states: "If it becomes apparent, during operation of the system, that contaminant levels have ceased to decline and are remaining constant at levels higher than the cleanup standards, that standard and the remedy may be reevaluated." This section should acknowledge that any change in the cleanup standards or remedy will require EPA approval.

3. Section 27 of the Tentative Order should be revised to reflect that the EPA must approve any future changes to cleanup standards. In addition, the first sentence of section 27 of the Tentative Order should be revised so that it does not imply that ARARs can be waived if they cannot be "reasonably attained". As stated in comment one above, section 121 of CERCLA allows EPA to waive ARARs only in the narrower situation where compliance with the cleanup standards would be "technically impracticable from an engineering perspective".

Honeywell

February 12, 1991

CALIFORNIA REGIONAL WATER

FEB 14 1991 GB

QUALITY CONTROL BOARD

Mr. Steven R. Ritchie
California Regional Water
Quality Control Board
1800 Harrison Street, Suite 700
Oakland CA 94612

Re: Honeywell Inc. - Synertek Building #1

Dear Mr. Ritchie:

The following comment pertains to the "Tentative Order, Proposed Remedial Action Plan and Site Cleanup Requirements For: Honeywell Inc. and The RREEF Funds, former Synertek #1 Facility, 3050 Coronado Drive, Santa Clara, Santa Clara County", dated December 27, 1990:

- Provision 2(a)(2) on page 16, requires that the implementation of a full scale groundwater injection system be completed within 90 days from approval of a proposal submitted in the report regarding the injection test results. We believe that 120 days would be more appropriate to assure that the following sub-tasks are completed in an appropriate fashion:

  - finalize design of full scale injection system
  - solicit, receive and evaluate bids from contractors
  - obtain necessary permits or access agreements
  - construct system
  - start-up

Therefore, we respectfully request that the above indicated provision be modified in order that a suitable time table be available to complete the required tasks.

Sincerely,

Steve G. Conn

Steve G. Conn
Corporate Project Engineer

cc: C.O. Geadelmann

GRAHAM & JAMES
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JAKARTA

IN ASSOCIATION WITH
DEACONS
SOLICITORS AND NOTARIES
HONG KONG

GB

January 14, 1991

WRITER'S DIRECT FAX NUMBER
(415) 362-6031

WRITER'S DIRECT DIAL NUMBER
(415) 954-0374

VIA FACSIMILE

Mr. Gregory Bartow
California Regional Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street
Suite 700
Oakland, California 94612

Re: Tentative Order Concerning The Proposed Remedial Action Plan And Site Cleanup Requirements For Honeywell Inc. and The RREEF Funds
Former Synertek #1 Facility, 3050 Coronado Drive, Santa Clara, Santa Clara County

Dear Greg:

We represent The RREEF Funds ("RREEF") with respect to the above-referenced Tentative Order.

As you and I discussed by telephone last Friday, January 11, 1991, I have reviewed the Tentative Order and have requested a clarification of one of its provisions. Paragraph C.12 of the Order (at page 22) requires RREEF to "file a report with the Board prior to any changes in site occupancy and ownership associated with its facilities described in this Order." I asked you to describe what such a report is to contain. You advised me that the report simply should inform the Board that a change in site occupancy or ownership had occurred and should provide the name of the new occupant or owner and of the person(s) who would act as the contact person for that occupant or owner.

With this clarification of the intended meaning of paragraph C.12, we do not object to the provision as drafted, and RREEF will comply in this fashion with the provision.

CAL02V.P50

If my understanding of the clarification is incorrect, please advise me.

Thank you for your cooperation in this.

Very truly yours,

Carolyn A. Lown
of
GRAHAM & JAMES

CAL:
cc: Ms. Sherie L. Dunn
Robert C. Thompson, Esq.

Our File: REEF 1.71

CAL02V.P50

ATTACHMENT B

ADMINISTRATIVE RECORD INDEX